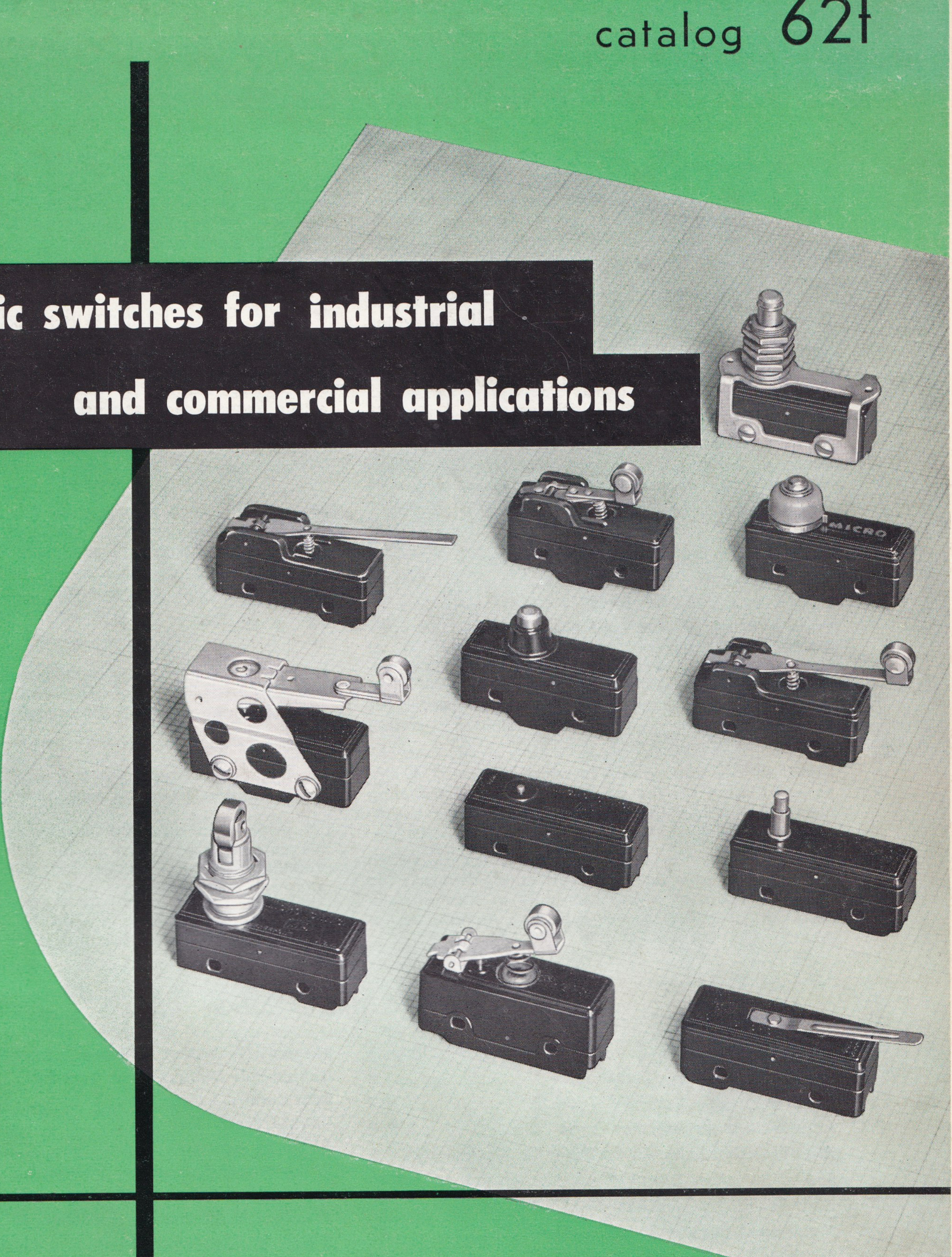
catalog 62f

basic switches for industrial and commercial applications



MICRO SWITCH
FREEPORT, ILLINOIS
A DIVISION OF HONEYWELL
IN CANADA: HONEYWELL CONTROLS LIMITED, TORONTO 17, ONTARIO

General Introduction

THIS CATALOG 62

This catalog covers a wide variety of MICRO SWITCH basic switches, auxiliary actuators and terminal enclosures. Switches shown are suitable for use in either alternating or direct current commercial and industrial applications.

OTHER BASIC SWITCH CATALOGS

There are two other MICRO SWITCH catalogs devoted to basic switches. Catalog 63 covers miniature size switch designs, while Catalog 78 has details of special purpose types for airborne and related uses.

EXTENSIVE QUALITY CONTROL

To insure precision operation and accurate repeatability throughout their long, trouble-free life, MICRO SWITCH products are laboratory tested from start to finish. From raw materials, through the assembly stage, to the completed product, MICRO SWITCH precision switches are subjected to a continuous series of rigid inspections and tests.

USES OF BASIC SWITCHES

Basic switches are, as their name implies, the basic means of starting and/or interrupting the flow of electricity through a circuit. Used alone in clean atmospheres, or housed in protective enclosures when exposed to the elements or physical abuse, basic switches have two primary uses: as limit and control switches.

Limit Switch — applications in which the switch is employed to shut off the power that drive a traveling mechanism, when the traveling unit reaches a predetermined point.

Control Switch — for applications in which the switch serves to initiate operation of other devices. The switch is operated either manually or mechanically as a part of a sequence or cycle in automatic equipment.

SPECIAL SWITCHES

Products covered in this catalog will fulfill most requirements for a plastic enclosed, precision switch. However MICRO SWITCH has available, or will design and build when necessary, special switches to fit requirements not met by these standard designs.

FIELD ENGINEERING SERVICE

MICRO SWITCH branch offices are located in principal cities throughout the United States and Canada. These offices are staffed by factory trained engineers whose experience in solving every type of switching problem is available to you.

WARRANTY

We warrant our products to be free from defects in material and workmanship and we will replace any such product we find to be so defective within one year after its delivery to the original purchaser. See List Price and Discount Schedule for full warranty details.

HOW TO ORDER

1. Specify proper and complete catalog listings. See page 3 for instructions for specifying desired contact arrangements and terminal designs.
2. Specify quantities of each item required.
3. Order auxiliary actuators (page 23) and terminal enclosures (page 25) separately from switches.

List prices and discounts applicable to products in this catalog are shown in the Price and Discount Schedule inserted in this catalog.

Quotations should be requested prior to placing large orders. These inquiries should be directed to the nearest MICRO SWITCH Branch Office.

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NOTE: Dimensions shown are subject to change. Current drawings will be supplied by your nearest MICRO SWITCH branch office.

Introduction To Basic Switches

WHAT IS A BASIC SWITCH?

A "basic switch" is generally defined as "a complete and self-contained switching unit", of which there are many sizes and shapes. They are used alone, gang mounted, built into assemblies or enclosed in metal housings.

Each switch consists of a patented snap-acting mechanism built into a molded phenolic case. The beryllium copper spring is designed to insure definite snap-action and accurate repeatability throughout the life of the switch. With each actuation the moveable silver contact snaps from one stationary contact to the other. When the actuating force is relieved, the moveable contact snaps back to its normal position. This operation is repeated with precision exactness for millions of actuations.

MICRO SWITCH makes many other kinds of switches commonly referred to as "basic switches". These are the basic types of their respective families and serve as the switching units in many types of assemblies. For more catalog information on any of these, contact your nearest MICRO SWITCH branch office.

ELECTRICAL RATING

Underwriters' Laboratories and Canadian Standards Association list MICRO SWITCH basic switches as follows:

Type "Z" switches (for general use, not requiring high inrush capacity)—15 amperes 125, 250 or 480 volts a-c; ½ ampere 125 volts d-c; ¼ ampere 250 volts d-c. ⅛ H. P. 125 volts a-c; ¼ H. P. 250 volts a-c. (Example, catalog listing BZ-2R).

Type "A" switches (for general use in applications which require high inrush or starting loads for motors and solenoids)—20 amperes 125, 250 or 480 volts a-c; 1. H. P. 125 volts a-c; 2 H. P. 250 volts a-c; 10 amperes 125 volts when controlling tungsten filament lamp loads on a-c circuits. (Example, catalog listing BA-2R).

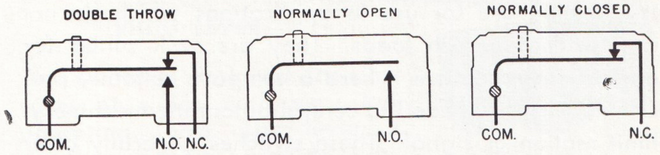
Underwriters' Laboratories listing for special switches, such as Split-Contact switches and Double-Pole Double-Throw switches, appear on the pages describing these switches.

CONTACTS ARE OF SILVER

The surface of the moveable silver contacts is formed in a series of parallel ridges called serrations. Laboratory tests have shown that serrated contacts have the same current carrying capacity as unserrated contacts, plus three other advantages.

1. They produce higher unit contact pressures, which reduces contact resistance.
2. This greater unit pressure will cut through films which may form on contact surfaces.
3. Serrated contacts increase the ability of the switch to break contact welds which may occur.

CHOICE OF CONTACT ARRANGEMENTS



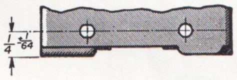
CHOICE OF CONTACT ARRANGEMENTS

Unless otherwise stated, Type "A" and "Z" momentary-contact basic switches in this catalog are single-pole double-throw. All such switches can also be provided as single-pole single-throw versions, either normally open or normally closed. Savings in cost will only become significant if large quantities of single-throw switches are needed. And since single-throw versions of all switches are not always carried as stock items, the nearest MICRO SWITCH Branch Office should be consulted if single-throw switches are desired.

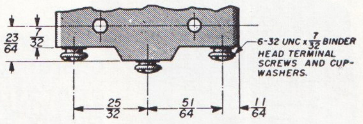
CHOICE OF TERMINAL DESIGNS

Unless otherwise specified basic switches shown in this catalog are available in four different terminal designs. Screw terminal catalog listings are derived by adding the screw terminal designation to the solder terminal catalog listing. (EXAMPLE: BZ-2R has solder terminals. BZ-2R-A2 has bottom-facing screw terminals and cup washers.)

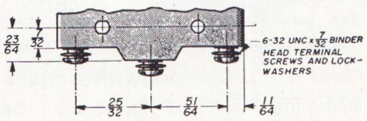
1.
Solder type terminals, which will accept up to No. 14 wire.



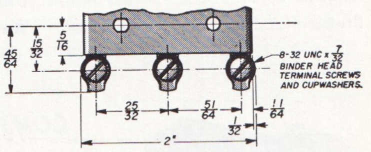
2.
"A2" terminals with bottom-facing screws and cupwashers, for stranded or plain wire.



3.
"T" terminals with bottom-facing screws and lock-washers, for ring and spade connectors.



4.
"P4" terminals with side-facing screws and cup-washers, for stranded or plain wire.



Tolerance: all fractions ± 1/64

DEFINITIONS OF OPERATING CHARACTERISTICS

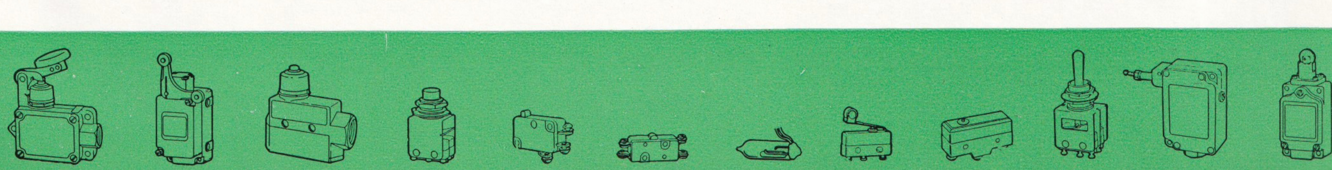
OPERATING FORCE — The amount of force applied to the switch plunger to cause "snap-over" of the contacts.

RELEASE FORCE — The amount of force still applied to the switch plunger at the instant of "snap-back" of the contacts to the unoperated position.

PRETRAVEL — The distance traveled in moving the plunger from "Free Position" to "Operating Position."

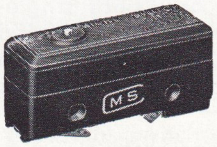
OVERTRAVEL — The distance beyond "Operating Position" to the safe limit of travel. Usually expressed as a minimum figure.

DIFFERENTIAL TRAVEL — The actuator travel from the point where the contacts "snap-over" to the point where the contacts "snap-back."



General Purpose Switches - Type "Z"

MICRO SWITCH General Purpose Basic Switches in this section are for use in applications which do not require high inrush loads. They are well suited for most a-c applications where a compact, reliable, precision switch is needed to control automatic machinery, limit motion or signal. These switches generally offer lower operating forces and motions than general purpose switches having higher electrical capacity. Basic switches with higher electrical capacities are covered in this catalog under "General Purpose Basic Switches—Type 'A'".



BZ-2R

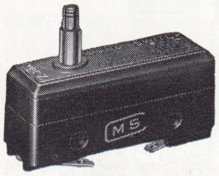
See page 3 for circuit and terminal variations.

PIN PLUNGER

This compact switch is designed for applications having only limited operating motion and overtravel. Very accurate operating characteristics suits it for use in thermostats, instruments and gaging devices.

OPERATING CHARACTERISTICS

Operating Force	9 to 13 oz.	Overtravel	.005 in. min.
Release Force	4 oz. min.	Diff. Travel	.0004 to .002 in.
Pretravel	1/64 in. max.	Weight	.047 lb.



BZ-2RS

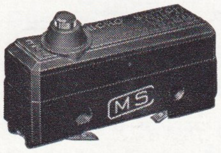
See page 3 for circuit and terminal variations.

OVERTRAVEL PLUNGER

This switch is for use with in-line operating motion. Although the operating characteristics are closely held the plunger permits a certain amount of overtravel.

OPERATING CHARACTERISTICS

Operating Force	9 to 13 oz.	Overtravel	1/16 in. min.
Release Force	4 oz. min.	Diff. Travel	.0004 to .002 in.
Pretravel	1/64 in. max.	Weight	.075 lb.



BZ-2RD

See page 3 for circuit and terminal variations.

COMPACT OVERTRAVEL PLUNGER

This switch has a large diameter plunger which allows 1/16 inch overtravel. In addition to in-line-motion applications, it can be used with slow moving cams whose rise is under 20 degrees.

OPERATING CHARACTERISTICS

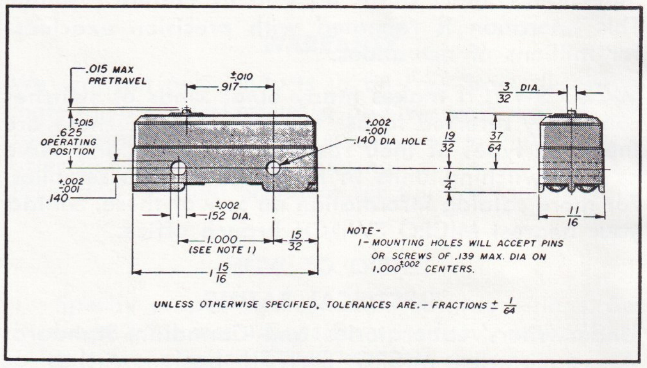
Operating Force	9 to 13 oz.	Overtravel	1/16 in. min.
Release Force	4 oz. min.	Diff. Travel	.0004 to .002 in.
Pretravel	1/64 in. max.	Weight	.076 lb.

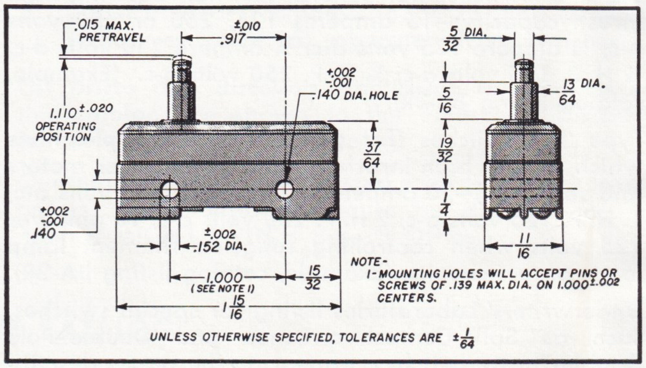
15 ACTUATOR DESIGNS

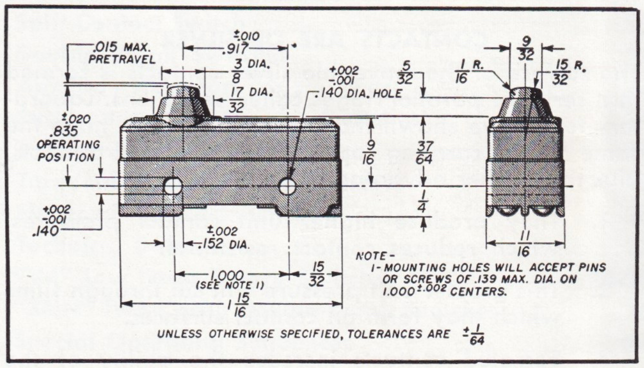
The General Purpose Basic Switches in this section offer a wide variety of actuating means and operating characteristics. The actuators are all constructed as an integral part of the switch to provide accurate repeatability throughout the life of the switch.

ELECTRICAL RATING

These switches are listed by Underwriters' Laboratories and the Canadian Standards Association for 15 amperes, 125, 250, or 480 volts a-c; 1/2 ampere, 125 volts d-c; 1/4 ampere, 250 volts d-c.

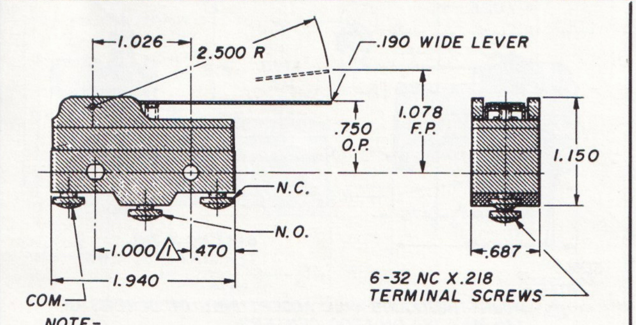

.015 MAX PRETRAVEL
±.010
.917
±.015
.625
OPERATING POSITION
+.002 -.001
.140
+.002 -.001
.140 DIA HOLE
3/32 DIA.
19/32
37/64
1/4
11/16
±.002
.152 DIA.
1.000
(SEE NOTE 1)
15/32
1 15/16
NOTE -
1- MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA ON 1.000±.002 CENTERS.
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE.— FRACTIONS ± 1/64


.015 MAX. PRETRAVEL
±.010
.917
1.110±.020
OPERATING POSITION
+.002 -.001
.140
+.002 -.001
.140 DIA. HOLE
37/64
5/32 DIA.
13/64 DIA.
5/16
19/32
1/4
11/16
±.002
.152 DIA.
1.000
(SEE NOTE 1)
15/32
1 15/16
NOTE -
1- MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000±.002 CENTERS.
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE ±1/64


.015 MAX. PRETRAVEL
±.010
.917
3/8 DIA.
17/32 DIA.
±.020
.835
OPERATING POSITION
+.002 -.001
.140
+.002 -.001
.140 DIA. HOLE
9/16
37/64
5/32
1/16 R.
9/32
15/32 R.
1/4
11/16
±.002
.152 DIA.
1.000
(SEE NOTE 1)
15/32
1 15/16
NOTE -
1- MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000±.002 CENTERS.
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE ±1/64

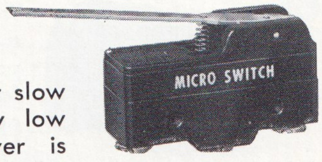
NOTE: Dimensions shown in this catalog are subject to change. Current Drawings will be supplied by your nearest MICRO SWITCH branch office.

General Purpose Switches - Type "Z" (cont.)


1.026
2.500 R
.190 WIDE LEVER
.750 O.P.
1.078 F.P.
1.150
N.C.
N.O.
1.000
1
.470
.687
1.940
COM.
6-32 NC X.218 TERMINAL SCREWS

NOTE-
⚠ - MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS

RIGID LEVER



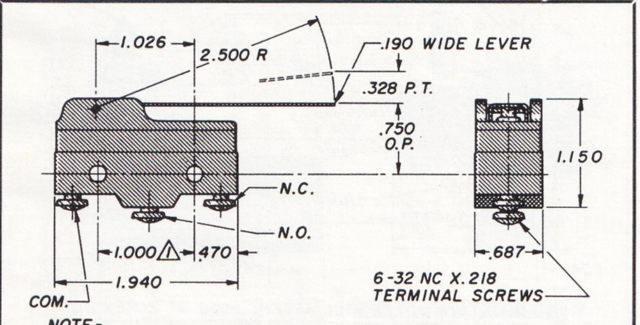
BZ-2RW80-A2

See page 3 for circuit and terminal variations.

This switch is designed for slow cams or slides with very low operating force. The lever is rigid enough to provide adequate strength, yet may be bent for adjustment by the user. A return spring dampens the effect of vibration upon the lever.

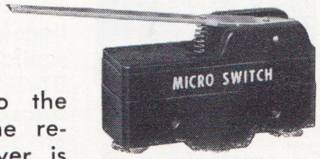
OPERATING CHARACTERISTICS

Operating Force	2-1/2 oz. max.	Overtravel	.219 in. min.
Release Force	1/2 oz. min.	Diff. Travel	.007 to .050 in.
Weight	.060 lb.		


1.026
2.500 R
.190 WIDE LEVER
.328 P.T.
.750 O.P.
1.150
N.C.
N.O.
1.000
1
.470
.687
1.940
COM.
6-32 NC X.218 TERMINAL SCREWS

NOTE-
⚠ - MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS

LOW FORCE SWITCH



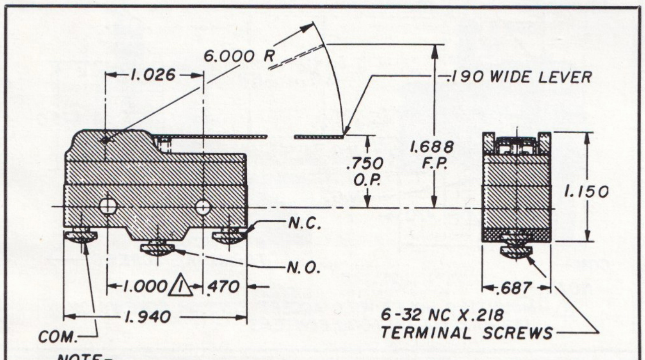
BZ-2RW84-A2

See page 3 for circuit and terminal variations.

This switch is similar to the BZ-2RW80 except that the return spring under the lever is eliminated to give it an extremely low operating force.

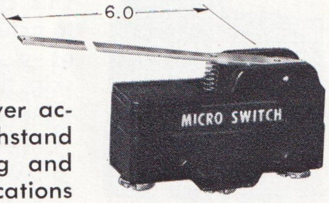
OPERATING CHARACTERISTICS

Operating Force	1 oz. max.	Overtravel	7/32 in. min.
Release Force	1/8 oz. min.	Diff. Travel	.007 to .050 in.
Weight	.060 lb.		


1.026
6.000 R
.190 WIDE LEVER
.750 O.P.
1.688 F.P.
1.150
N.C.
N.O.
1.000
1
.470
.687
1.940
COM.
6-32 NC X.218 TERMINAL SCREWS

NOTE-
⚠ - MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS

LONG LEVER ACTUATOR



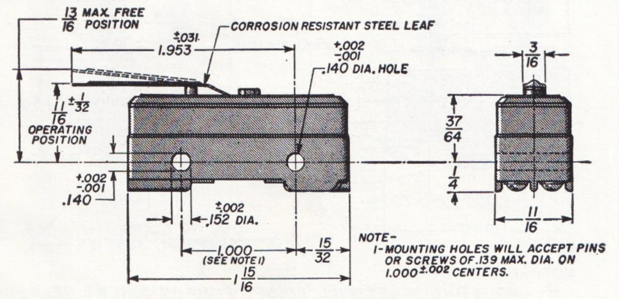
BZ-2RW863-A2

See page 3 for circuit and terminal variations.

This switch has a long lever actuator designed to withstand excessive impact, bending and overtravel for such applications as counting bulky material where precision actuation is not a critical factor.

OPERATING CHARACTERISTICS

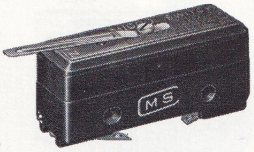
Operating Force	1 oz. max.	Diff. Travel	.018 to .140 in.
Overtravel	.578 in. min.	Weight	.070 lb.


13/16 MAX. FREE POSITION
CORROSION RESISTANT STEEL LEAF
±.031
1.953
+.002 -.001
.140 DIA. HOLE
11/16 ±1/32 OPERATING POSITION
+.002 -.001 .140
±.002 .152 DIA.
1.000 (SEE NOTE 1)
15/32
1 15/16
3/16
37/64
1/4
11/16

NOTE-
1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000±.002 CENTERS.

UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE ±1/64

FLEXIBLE LEAF



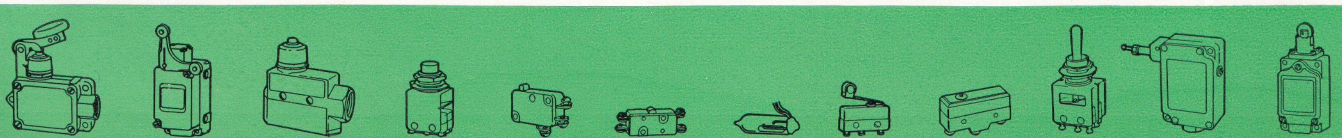
BZ-2RL

See page 3 for circuit and terminal variations.

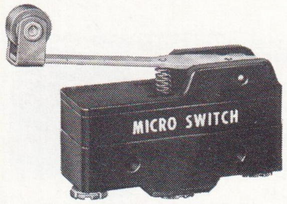
This leaf actuator switch is for use in applications with small operating force but with greater actuating movement than is required with plunger type switches. It is useful with slow moving slides or cams. Overtravel should be limited to 1/16 inch.

OPERATING CHARACTERISTICS

Operating Force	5 oz. max.	Overtravel	not over 1/16 in.
Release Force	1/2 oz. min.	Diff. Travel	.050 in. max.
Weight	.050 lb.		



General Purpose Switches - Type "Z" (cont.)



BZ-2RW82-A2

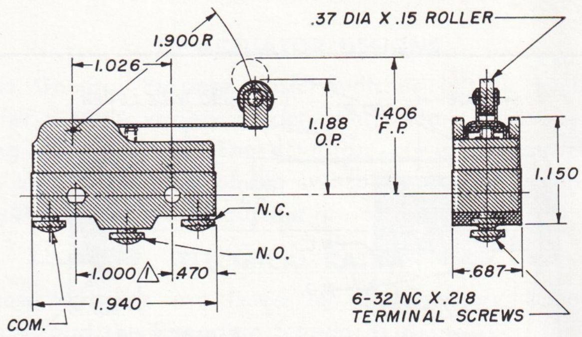
See page 3 for circuit and terminal variations

ROLLER LEVER

The rigid lever actuator has a hardened steel roller which particularly suits this switch for fast cam operation where operating force may be very low. Effect of vibration upon the actuator is reduced by a return spring.

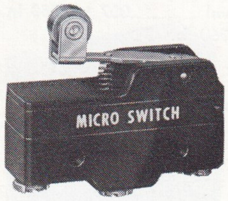
OPERATING CHARACTERISTICS

Operating Force	3½ oz. max.	Overtravel	.156 in. min.
Release Force	¾ oz. min.	Diff. Travel	.04 to .040 in.
Weight	.063 lb.		



.37 DIA X .15 ROLLER
1.900 R
1.026
1.188
O.P.
1.406
F.P.
1.150
N.C.
N.O.
1.000
.470
.687
1.940
COM.
6-32 NC X.218
TERMINAL SCREWS

NOTE –
⚠ – MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS



BZ-2RW822-A2

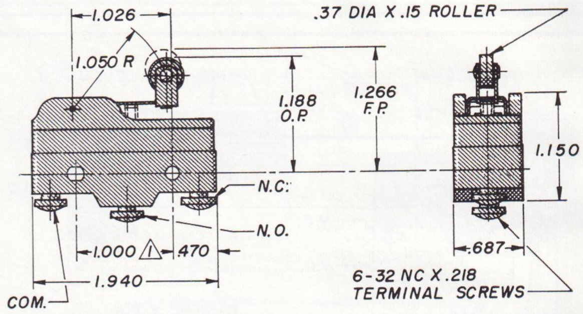
See page 3 for circuit and terminal variations

SHORT ROLLER LEVER

This compact design is for actuation by fast rotating cams and similar devices. As in the BZ-2RW80 and BZ-2RW82, a coil spring under the lever dampens the effect of vibration.

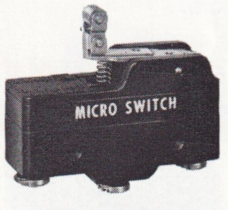
OPERATING CHARACTERISTICS

Operating Force	6 oz. max.	Overtravel	3/32 in. min.
Release Force	1½ oz. min.	Diff. Travel	.003 to .020 in.
Weight	.063 lb.		



1.026
.37 DIA X .15 ROLLER
1.050 R
1.188
O.P.
1.266
F.P.
1.150
N.C.
N.O.
1.000
.470
.687
1.940
COM.
6-32 NC X.218
TERMINAL SCREWS

NOTE –
⚠ – MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS



BZ-2RW825-A2

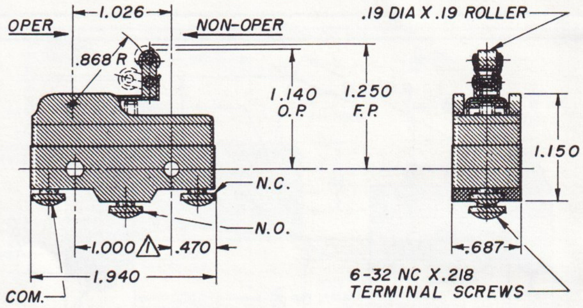
See page 3 for circuit and terminal variations

ONE WAY ACTUATOR

This compact switch is designed to actuate on the forward motion of a cam, dog or slide, and skip the actuation on the return stroke. The use of a spring loaded, hinged actuator causes the roller lever to return to the free position after each actuation.

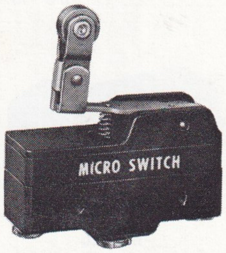
OPERATING CHARACTERISTICS

Operating Force	8 oz. max.	Overtravel	Not over .109 in.
Release Force	1½ oz. min.	Diff. Travel	.015 in. max.
Weight	.065 lb.		



OPER
1.026
NON-OPER
.19 DIA X .19 ROLLER
.868 R
1.140
O.P.
1.250
F.P.
1.150
N.C.
N.O.
1.000
.470
.687
1.940
COM.
6-32 NC X.218
TERMINAL SCREWS

NOTE –
⚠ – MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS



BZ-2RW826-A2

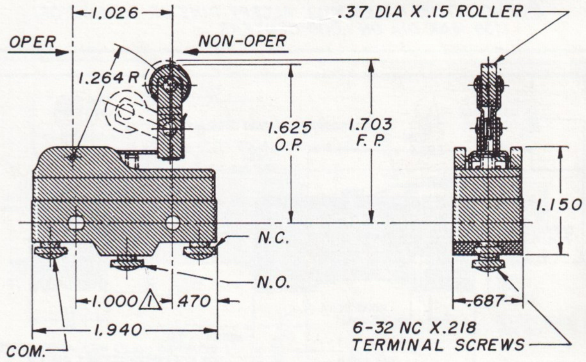
See page 3 for circuit and terminal variations

ONE WAY ACTUATOR

This switch, as well as the BZ-2RW825-A2, is useful in providing an electrical impulse to relays and solenoids when an impulse is required from one direction only on a reciprocal movement.

OPERATING CHARACTERISTICS

Operating Force	6 oz. max.	Overtravel	.094 in. min.
Release Force	1½ oz. min.	Diff. Travel	.003 to .020 in.
Weight	.070 lb. approx.		

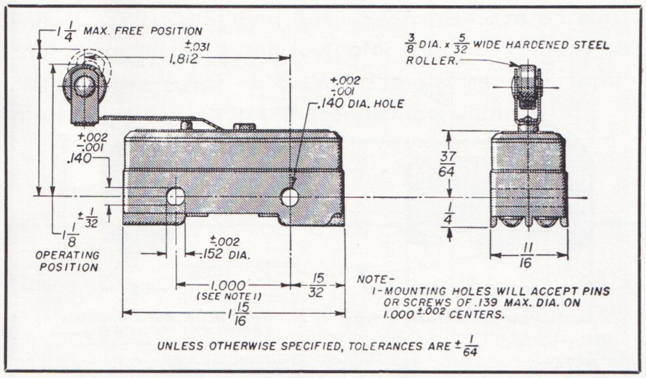


1.026
.37 DIA X .15 ROLLER
OPER
NON-OPER
1.264 R
1.625
O.P.
1.703
F.P.
1.150
N.C.
N.O.
1.000
.470
.687
1.940
COM.
6-32 NC X.218
TERMINAL SCREWS

NOTE –
⚠ – MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS

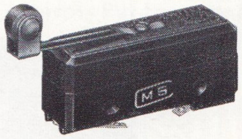
NOTE: Dimensions shown in this catalog are subject to change. Current Drawings will be supplied by your nearest MICRO SWITCH branch office.

General Purpose Switches - Type "Z" (cont.)


1 1/4 MAX. FREE POSITION
±.031
1.812
3/8 DIA. x 5/32 WIDE HARDENED STEEL ROLLER.
+.002 -.001 .140 DIA. HOLE
+.002 -.001 .140
37/64
1 1/32
1 1/8 OPERATING POSITION
1/4
±.002 .152 DIA.
11/16
1.000 (SEE NOTE 1)
15/32
1 15/16
NOTE- 1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000±.002 CENTERS.
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE ± 1/64

ROLLER LEAF

This switch is useful in applications with small force and relatively large operating movement, such as low power synchronous motors. Recommended limit of overtravel is 1/16 inch.

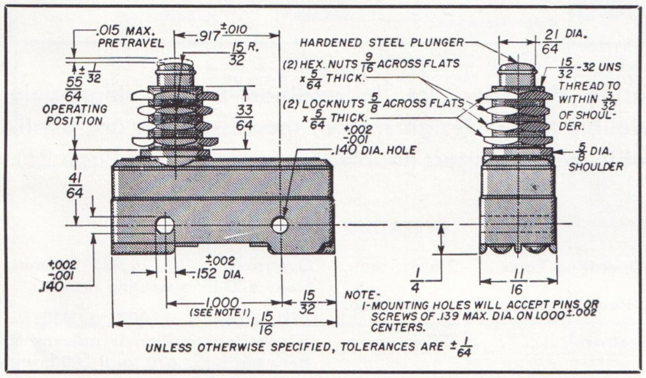


BZ-2RL2

See page 3 for circuit and terminal variations.

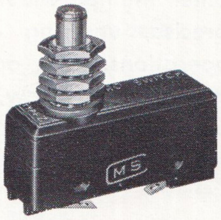
OPERATING CHARACTERISTICS

Operating Force.....5 oz. max.
Overtravel.....not over 1/16 in.
Release Force.......1/2 oz. min.
Diff. Travel.........050 in. max.
Weight..................060 lb.


.015 MAX. PRETRAVEL
.917 ±.010
15/32 R.
HARDENED STEEL PLUNGER
21/64 DIA.
1 55/64 ±1/32 OPERATING POSITION
(2) HEX. NUTS 9/16 ACROSS FLATS x 5/64 THICK.
15/32-32 UNS THREAD TO WITHIN 3/32 OF SHOULDER.
33/64
(2) LOCKNUTS 5/8 ACROSS FLATS x 5/64 THICK.
+.002 -.001 .140 DIA. HOLE
5/8 DIA. SHOULDER
41/64
+.002 -.001 .140
±.002 .152 DIA.
1/4
11/16
1.000 (SEE NOTE 1)
15/32
1 15/16
NOTE- 1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000±.002 CENTERS.
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE ± 1/64

PANEL MOUNT PLUNGER

This switch can be used as a manual or mechanical push button or for in-line operation where considerable overtravel is desired. Panel mounting permits adjustment of operating point with respect to the actuating device.

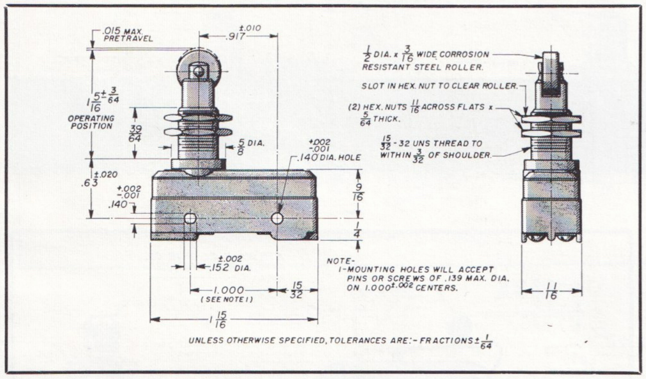


BZ-2RQ1

See page 3 for circuit and terminal variations.

OPERATING CHARACTERISTICS

Operating Force.....9 to 13 oz.
Overtravel..........7/32 in. max.
Release Force.........4 oz. min.
Diff. Travel......0004 to .002 in.
Weight..................081 lb.


.015 MAX. PRETRAVEL
.917 ±.010
1/2 DIA. x 3/16 WIDE CORROSION RESISTANT STEEL ROLLER.
SLOT IN HEX. NUT TO CLEAR ROLLER.
(2) HEX. NUTS 11/16 ACROSS FLATS x 5/64 THICK.
1 5/16 ±3/64 OPERATING POSITION
39/64
5/8 DIA.
+.002 -.001 .140 DIA. HOLE
15/32-32 UNS THREAD TO WITHIN 3/32 OF SHOULDER.
.63 ±.020
+.002 -.001 .140
9/16
1/4
±.002 .152 DIA.
NOTE- 1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000±.002 CENTERS.
1.000 (SEE NOTE 1)
15/32
11/16
1 15/16
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE:- FRACTIONS ± 1/64

ROLLER PLUNGER

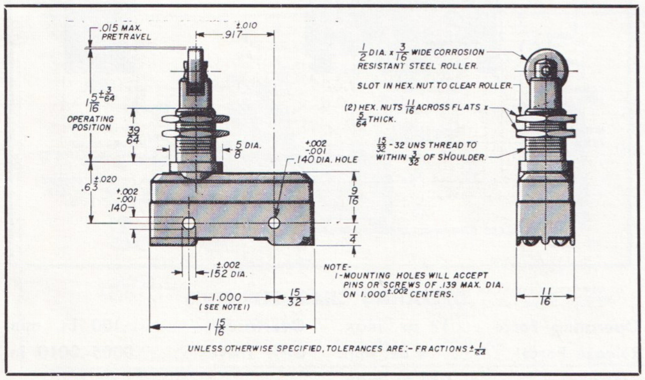
This panel mounting switch is designed for precision, heavy-duty actuation by cams having an approach angle as great as 30 degrees. The operating point may be adjusted with respect to the actuating device by positioning in the panel.

BZ-2RQ18

See page 3 for circuit and terminal variations.

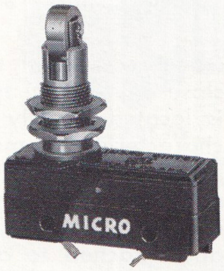
OPERATING CHARACTERISTICS

Operating Force....9 to 13 oz.
Overtravel..........140 in. min.
Release Force.........4 oz. min.
Diff. Travel.....0004 to .002 in.
Pretravel...........015 in. max.
Weight..................107 lb.


.015 MAX. PRETRAVEL
.917 ±.010
1/2 DIA. x 3/16 WIDE CORROSION RESISTANT STEEL ROLLER.
SLOT IN HEX. NUT TO CLEAR ROLLER.
(2) HEX. NUTS 11/16 ACROSS FLATS x 5/64 THICK.
1 5/16 ±3/64 OPERATING POSITION
39/64
5/8 DIA.
+.002 -.001 .140 DIA. HOLE
15/32-32 UNS THREAD TO WITHIN 3/32 OF SHOULDER.
.63 ±.020
+.002 -.001 .140
9/16
1/4
±.002 .152 DIA.
NOTE- 1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000±.002 CENTERS.
1.000 (SEE NOTE 1)
15/32
11/16
1 15/16
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE:- FRACTIONS ± 1/64

CROSS-ROLLER PLUNGER

This switch is identical to the BZ-2RQ18 with the exception that is roller is turned 90 degrees to accommodate cam approach across the switch.

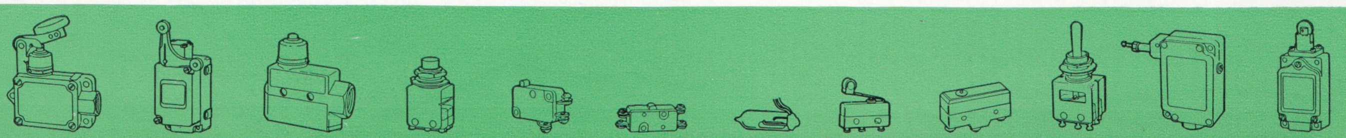


BZ-2RQ181

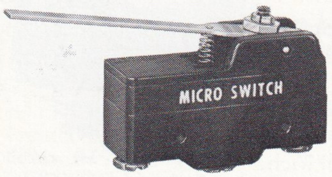
See page 3 for circuit and terminal variations.

OPERATING CHARACTERISTICS

Operating Force ......9 to 13 oz.
Release Force ....4 oz. min.
Pretravel ....015 in. max.
Overtravel ....140 in. min.
Diff. Travel ......0004 to .002 in.
Weight ....107 lb.



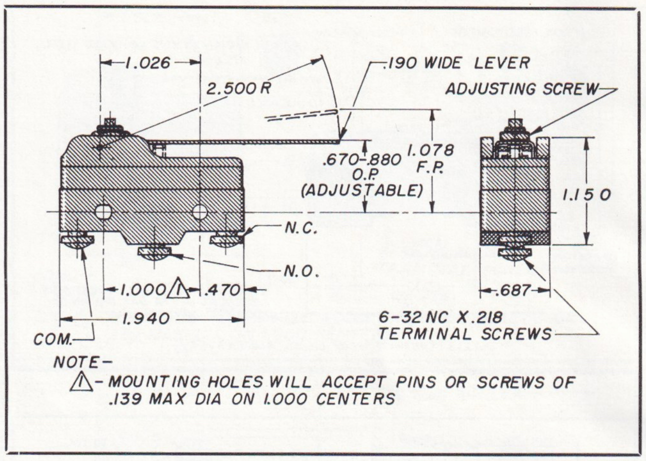
Adjustable Lever Actuator - Type "Z"



BZ-2RW899-A2

See Page 3 for circuit and terminal variations.

This switch features an adjustable lever actuator which permits close adjustment of the operating position without removing the switch from its mounting. It is designed for use on such applications as timers, computers or other multiple-mounted switch devices which require precise, unerring actuation throughout millions of operations. The operating position is controlled by an adjusting screw, which either raises or lowers the operating position of the lever actuator within the range of .670 to .880 inch.


1.026
2.500 R
.190 WIDE LEVER
ADJUSTING SCREW
.670-.880
O.P.
(ADJUSTABLE)
1.078
F.P.
1.150
N.C.
N.O.
1.000
.470
.687
1.940
6-32 NC X .218
TERMINAL SCREWS
COM.
NOTE -
- MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS

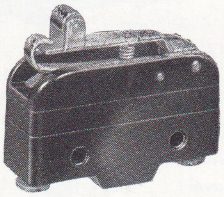
VARIATIONS AVAILABLE

Adjustable actuators are available in either straight or formed leaf designs, and either with or without a roller. All adjustable lever actuator switches can be provided with a wide selection of preset operating characteristics. In addition to the single-pole double-throw design shown, these switches are available in split-contact double-throw design (see Page 21).

OPERATING CHARACTERISTICS

Operating Force____2½ oz. max.
Release Force_______½ oz. min.
Pretravel__________.328 in. max.
Overtravel _________.125 in. min. From .670 in. operating position
Diff. Travel_____.007 to .050 in. (Operating position is adjustable between_____.670 and .880 in.)

High-Precision Roller Lever - Type "Z"



BZ-RW922-A2

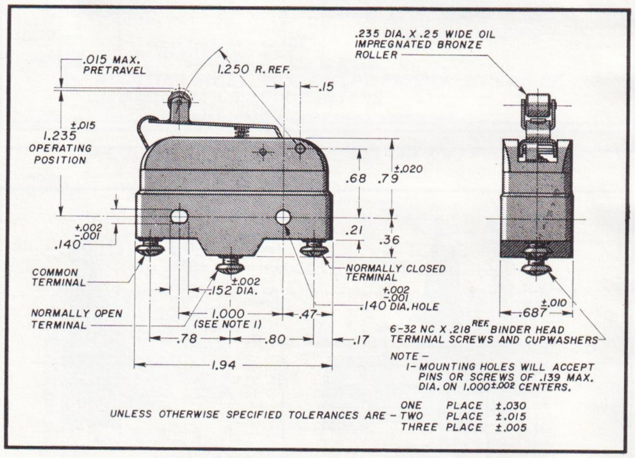
See Page 3 for circuit and terminal variations.

Accurate repeatability and stability of characteristics — factors normally attributed only to short travel pin plunger switches — are provided with this new design of a roller operated basic switch.

Thus, the designer is given a much more flexible unit in that it offers a large overtravel while still maintaining a low pretravel and close differential travel. Because the actuating roller is located directly over the switch plunger, drift of characteristics remain at a minimum even after millions of operations. The switch case is made of mineral filled phenolic which gives further stability of characteristics. The roller is of oil impregnated bronze and attached to a corrosion resistant steel lever.

ELECTRICAL RATING

10 amperes 125, 250, 480 volts ac.


.015 MAX.
PRETRAVEL
1.250 R. REF.
.15
.235 DIA. X .25 WIDE OIL IMPREGNATED BRONZE ROLLER
1.235 ±.015
OPERATING POSITION
.68
.79 ±.020
.21
.36
+.002 -.001
.140
COMMON TERMINAL
NORMALLY CLOSED TERMINAL
±.002
.152 DIA.
+.002 -.001
.140 DIA. HOLE
NORMALLY OPEN TERMINAL
1.000
(SEE NOTE 1)
.47
.78
.80
.17
1.94
.687 ±.010
6-32 NC X .218 REF. BINDER HEAD TERMINAL SCREWS AND CUPWASHERS
NOTE -
1- MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000±.002 CENTERS.
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE - ONE PLACE ±.030
TWO PLACE ±.015
THREE PLACE ±.005

OPERATING CHARACTERISTICS

Operating Force____12 oz. max.
Release Force ________4 oz. min.
Pretravel___________.015 in. max.
Overtravel_________.100 in. min.
Diff. Travel______.0005-.0010 in.

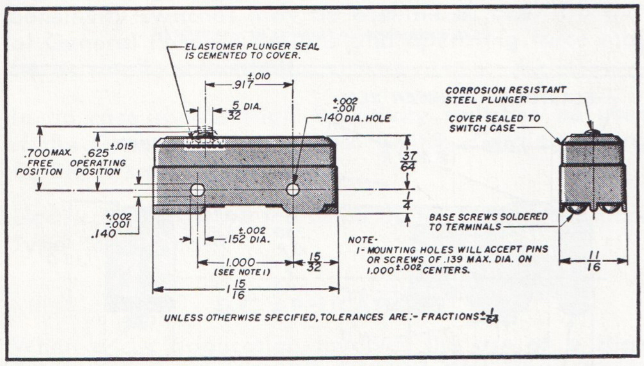
NOTE: Dimensions shown in this catalog are subject to change. Current Drawings will be supplied by your nearest MICRO SWITCH branch office.

Sealed Switches - Type "Z"

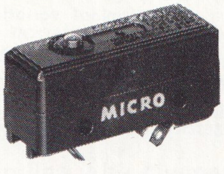
MICRO SWITCH Sealed Basic Switches have an elastomer boot around the actuator and a cement seal around the cover, preventing moisture and foreign matter from entering the switching chamber.

All features of the Type "Z" General Purpose Basic Switches, including the electrical rating, are retained. Close manufacturing tolerances and quality control procedures insure accurate operating characteristics throughout a long life.

PIN PLUNGER


ELASTOMER PLUNGER SEAL IS CEMENTED TO COVER.
±.010
.917
5/32 DIA.
+.002 -.001
.140 DIA. HOLE
CORROSION RESISTANT STEEL PLUNGER
COVER SEALED TO SWITCH CASE
.700 MAX. FREE POSITION
.625 ±.015 OPERATING POSITION
37/64
1/4
+.002 -.001
.140
±.002
.152 DIA.
BASE SCREWS SOLDERED TO TERMINALS
NOTE-
1- MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000 ±.002 CENTERS.
1.000 (SEE NOTE 1)
15/32
1 15/16
11/16
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE :- FRACTIONS ±1/64

This switch is for use in applications requiring compactness, very accurate operating characteristics and having limited overtravel.



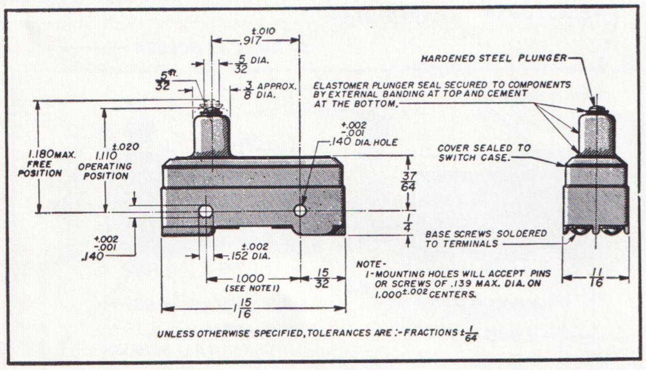
BZ-2R55

See page 3 for circuit and terminal variations.

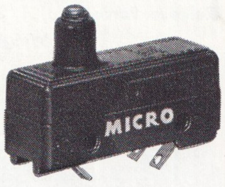
OPERATING CHARACTERISTICS

Operating Force_____9 to 15 oz.
Release Force________4 oz. min.
Overtravel_________.005 in. min.
Diff. Travel____.0004 to .0025 in.
Weight__________.055 lb. approx.

OVERTRAVEL PLUNGER


±.010
.917
5/32 DIA.
5/32 R.
3/8 APPROX. DIA.
HARDENED STEEL PLUNGER
ELASTOMER PLUNGER SEAL SECURED TO COMPONENTS BY EXTERNAL BANDING AT TOP AND CEMENT AT THE BOTTOM.
+.002 -.001
.140 DIA. HOLE
COVER SEALED TO SWITCH CASE.
1.180 MAX. FREE POSITION
1.110 ±.020 OPERATING POSITION
37/64
1/4
+.002 -.001
.140
±.002
.152 DIA.
BASE SCREWS SOLDERED TO TERMINALS
NOTE-
1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000 ±.002 CENTERS.
1.000 (SEE NOTE 1)
15/32
1 15/16
11/16
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE :- FRACTIONS ±1/64

This switch is for use with in-line operating motion. Although the operating characteristics are closely held, the plunger permits limited overtravel.



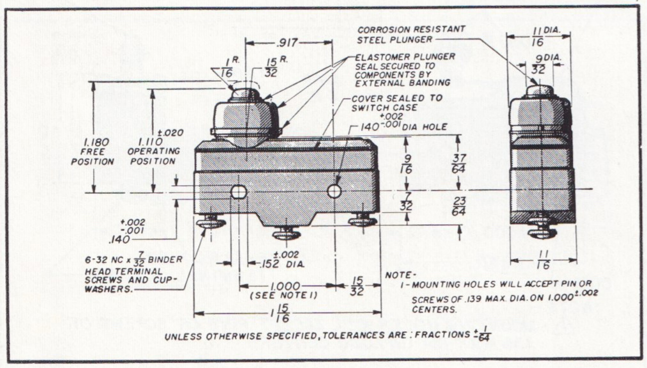
BZ-2RS55

See page 3 for circuit and terminal variations.

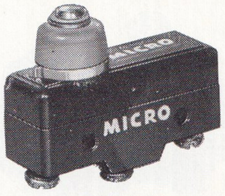
OPERATING CHARACTERISTICS

Operating Force_____9 to 15 oz.
Release Force________4 oz. min.
Overtravel________1/16 in. min.
Diff. Travel __ .0004 to .0025 in.
Weight___________.065 lb. approx.

COMPACT OVERTRAVEL PLUNGER


CORROSION RESISTANT STEEL PLUNGER
.917
1/16 R.
15/32 R.
ELASTOMER PLUNGER SEAL SECURED TO COMPONENTS BY EXTERNAL BANDING
COVER SEALED TO SWITCH CASE
+.002 -.001
140 DIA HOLE
11/16 DIA.
9/32 DIA.
1.180 FREE POSITION
1.110 ±.020 OPERATING POSITION
9/16
7/32
37/64
23/64
+.002 -.001
.140
6-32 NC x 7/32 BINDER HEAD TERMINAL SCREWS AND CUP-WASHERS.
±.002
.152 DIA
1.000 (SEE NOTE 1)
15/32
1 15/16
11/16
NOTE-
1-MOUNTING HOLES WILL ACCEPT PIN OR SCREWS OF .139 MAX. DIA. ON 1.000 ±.002 CENTERS.
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE : FRACTIONS ±1/64

This switch has a large diameter plunger which allows 1/16 inch overtravel. In addition to in-line motion applications, it can be used with slow cams whose rise is under 20 degrees.

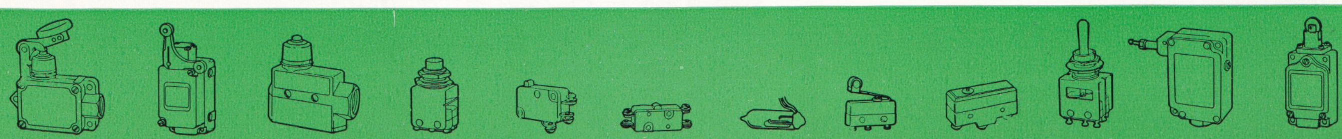


BZ-2RDS-A2

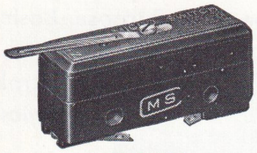
See page 3 for circuit and terminal variations.

OPERATING CHARACTERISTICS

Operating Force____13 to 15 oz.
Release Force________4 oz. min.
Overtravel ______1/16 in. min.
Diff. Travel ___ .0004 to .0025 in.
Weight_________________.088 lb.



Sealed Switches - Type "Z" (cont.)

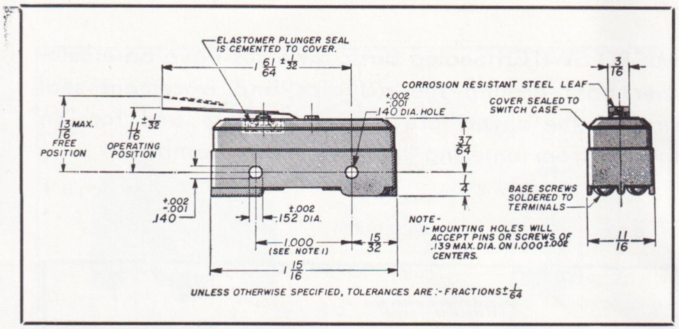


BZ-2RL55

See page 3 for circuit and terminal variations.

FLEXIBLE LEAF

This switch is for use in applications with small operating force, but with greater actuating movement than is required with plunger type switches. It is useful with cams or slides but overtravel should be limited to 1/16 in.

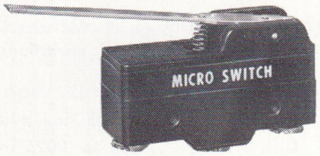

ELASTOMER PLUNGER SEAL IS CEMENTED TO COVER.
1 61/64 ±1/32
CORROSION RESISTANT STEEL LEAF
3/16
COVER SEALED TO SWITCH CASE
+.002 -.001 .140 DIA. HOLE
13/16 MAX. FREE POSITION
11/16 ±1/32 OPERATING POSITION
37/64
1/4
BASE SCREWS SOLDERED TO TERMINALS
+.002 -.001 .140
±.002 .152 DIA.
1.000 (SEE NOTE 1)
15/32
1 15/16
11/16

NOTE - 1- MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000 ±.002 CENTERS.

UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE:- FRACTIONS ±1/64

OPERATING CHARACTERISTICS

Operating Force	7 oz. max.	Overtravel	not over 1/16 in.
Release Force	1/2 oz. min.	Diff. Travel	.050 in. max.
Weight	.052 lb. approx.		

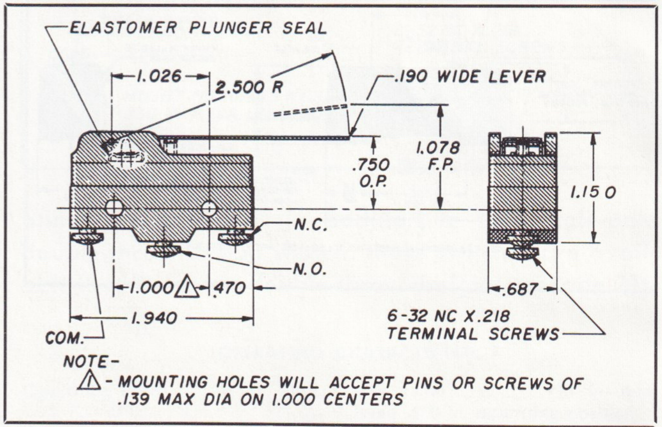


BZ-2RW855-A2

See page 3 for circuit and terminal variations.

RIGID LEVER

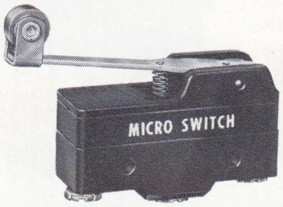
This switch is designed for slow cams or slides with very low operating force. The lever actuator may be bent for adjustment by the user.


ELASTOMER PLUNGER SEAL
1.026
2.500 R
.190 WIDE LEVER
.750 O.P.
1.078 F.P.
1.150
N.C.
N.O.
1.000
470
1.940
COM.
.687
6-32 NC X.218 TERMINAL SCREWS

NOTE - △ - MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS

OPERATING CHARACTERISTICS

Operating Force	2-1/2 oz. max.	Overtravel	7/32 in. min.
Release Force	1/2 oz. min.	Diff. Travel	.007 to .050 in. min.
Weight	.061 lb. approx.		

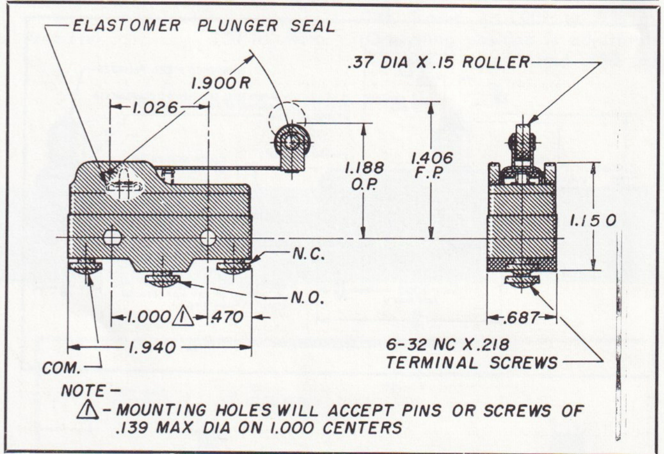


BZ-2RW8255-A2

See page 3 for circuit and terminal variations.

ROLLER LEVER

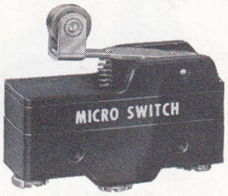
The rigid lever actuator has a hardened steel roller which particularly suits this switch for fast cam operation where operating force may be very low.


ELASTOMER PLUNGER SEAL
.37 DIA X .15 ROLLER
1.900 R
1.026
1.188 O.P.
1.406 F.P.
1.150
N.C.
N.O.
1.000
470
1.940
COM.
.687
6-32 NC X.218 TERMINAL SCREWS

NOTE - △ - MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS

OPERATING CHARACTERISTICS

Operating Force	3-1/2 oz. max.	Overtravel	.156 oz. min.
Release Force	3/4 oz. min.	Diff. Travel	.005 to .040 in.
Weight	.065 lb. approx.		

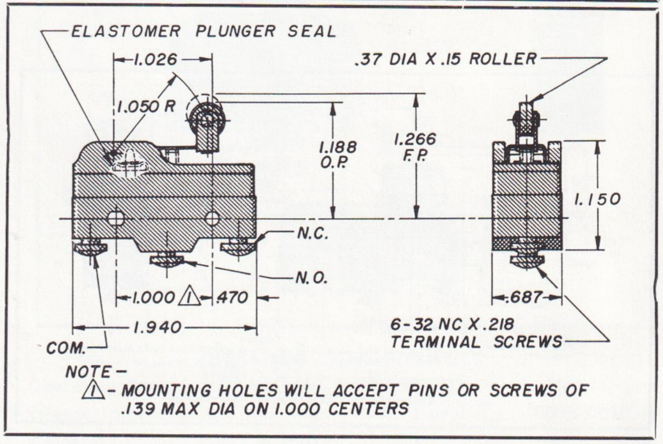


BZ-2RW82255-A2

See page 3 for circuit and terminal variations.

SHORT ROLLER LEVER

This compact switch has a hardened steel roller for actuation by fast rotating cams and similar devices.


ELASTOMER PLUNGER SEAL
1.026
.37 DIA X .15 ROLLER
1.050 R
1.188 O.P.
1.266 F.P.
1.150
N.C.
N.O.
1.000
470
1.940
COM.
.687
6-32 NC X.218 TERMINAL SCREWS

NOTE - △ - MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS

OPERATING CHARACTERISTICS

Operating Force	6 oz. max.	Overtravel	.083 in. min.
Release Force	1-1/2 oz. min.	Diff. Travel	.003 to .020 in.
Weight	.065 lb. approx.		

NOTE: Dimensions shown in this catalog are subject to change. Current Drawings will be supplied by your nearest MICRO SWITCH branch office.

High-Sensitivity Switches-Type "Z"

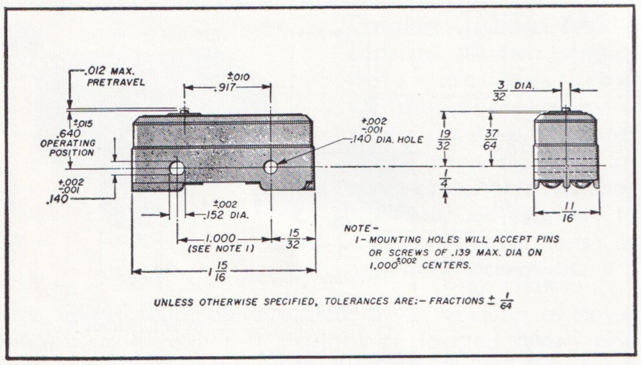
MICRO SWITCH High Sensitivity Basic Switches provide extremely accurate repetition of point of operation through millions of switch actuations in applications where force and movement are limited. They are useful for actuation by vapor filled bellows, delicate thermostatic controls, pressure-sensitive instruments, and very sensitive manual or automatic sorting and gaging devices. Differential travel of High Sensitivity switches may be as little as one-fifth that of General Purpose designs and operating force may be as small as one-half.

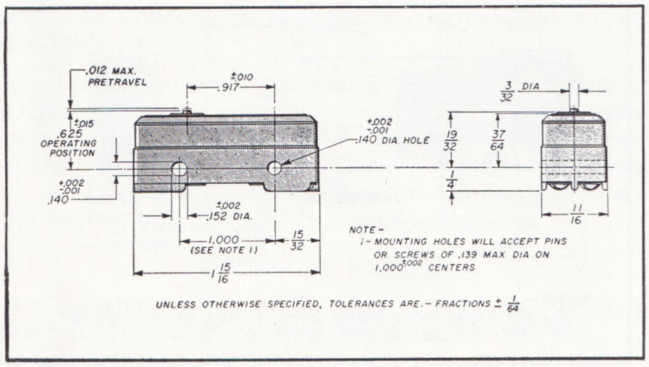
In no case should High Sensitivity switches be used if the General Purpose Basic Switch, Catalog Listing BZ-2R, is satisfactory.

Electrical ratings are the same as for General Purpose Type "Z" switches.

D-C APPLICATIONS

When a d-c application involves the use of a High Sensitivity switch, MICRO SWITCH engineers should be consulted. Because of their small contact separation, High Sensitivity switches are not generally recommended for d-c circuits unless the switch is given proper contact protection with condenser-resistor protective circuits.


.012 MAX. PRETRAVEL
±.010 .917
±.015 .640 OPERATING POSITION
+.002 -.001 .140
±.002 .152 DIA.
1.000 (SEE NOTE 1)
15/32
1 15/16
+.002 -.001 .140 DIA. HOLE
3/32 DIA.
19/32
37/64
1/4
11/16
NOTE- 1- MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA ON 1.000±.002 CENTERS.
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE:- FRACTIONS ± 1/64


.012 MAX. PRETRAVEL
±.010 .917
±.015 .625 OPERATING POSITION
+.002 -.001 .140
±.002 .152 DIA.
1.000 (SEE NOTE 1)
15/32
1 15/16
+.002 -.001 .140 DIA. HOLE
3/32 DIA
19/32
37/64
1/4
11/16
NOTE- 1- MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000±.002 CENTERS
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE.- FRACTIONS ± 1/64

CAUTIONS TO OBSERVE WITH THE BZ-R19

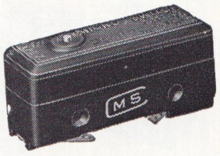
To assure the exacting performance for which this switch is designed and built, the following should be observed:

1. Limit load to 10 watts at 125 volts a-c, or 5 watts at 25 volts d-c.
2. Electrical loads should be constant. If necessary use relays to keep load within limits stated.
3. Mount the switch securely on firm supports.
4. Apply operating motion in line with plunger motion.
5. Limit force applied to the switch plunger to 5 lbs.

The single-pole double-throw contact arrangement permits sorting or gaging by either applying force to, or releasing, the switch plunger. By employing two or more switches with lamps, relays or solenoids, indications of varying degrees of size may be obtained, with or without automatic sorting.

PIN PLUNGER

This is a specially constructed pin plunger switch. The extreme accurate repeatability of this pin plunger is insured by its unique construction, careful assembly and close adjustment. In tests up to three million actuations the maximum variation of operating position (repeatability) in any 100,000 consecutive operations is .0001 inch.


BZ-R19

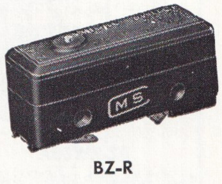
Also available with "A2" terminals. See page 3.

OPERATING CHARACTERISTICS

Operating Force	7 to 12 oz.	Overtravel	.005 to .008 in.
Release Force	4 oz. min.	Diff. Travel	.0002 to .0008 in.
Pretravel	.012 in. max.	Weight	.051 lb.

PIN PLUNGER

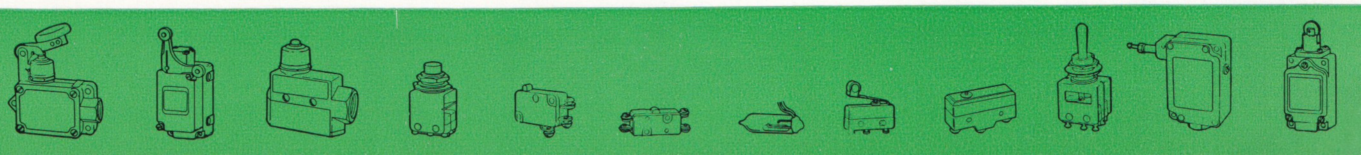
Catalog Listing BZ-R is for applications which require more exacting operating characteristics than those offered by General Purpose Basic Switches. Contact arrangement is single-pole double-throw.


BZ-R

Also available with "A2" terminals. See page 3.

OPERATING CHARACTERISTICS

Operating Force	7 to 9 oz.	Overtravel	.005 in. min.
Release Force	4 oz. min.	Diff. Travel	.0002 to .0003 in.
Pretravel	.012 in. max.	Weight	.051 lb.



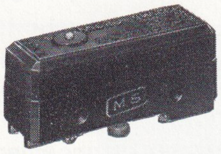
Maintained Contact Switches - Type "Z"

MICRO SWITCH Maintained-Contact Basic Switches are designed for switching applications requiring sustained contact after plunger force has been relieved, but with provision for resetting the switch for succeeding operations.

These switches have one plunger which operates through the cover and another (reset) plunger that operates through the bottom of the switch case. Operation of either plunger causes the spring, with its contact, to snap to the other side and remain there until the other plunger is operated. The cover plunger provides more accurate and uniform operation than does the reset plunger. The cover plunger should be used where closely held characteristics are most important. The plastic reset plunger, common to all three switches, may be operated mechanically but only by straight-line motion, coaxial with plunger movement.

ELECTRICAL RATING

15 amperes, 125 or 480 volts a-c; ½ ampere 125 volts d-c; ¼ ampere 250 volts d-c; ⅛ H.P. 125 volts a-c; ¼ H.P. 250 volts a-c.



BZ-RX

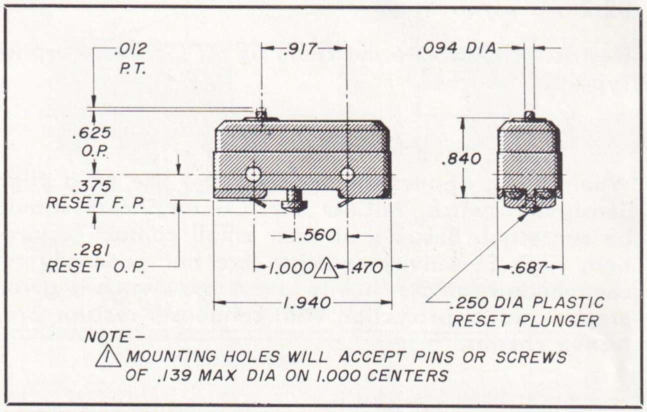
See page 3 for circuit variations. Solder type terminals only.

PIN PLUNGER

This compact switch has a pin plunger in the cover which provides only limited overtravel but very accurate operating characteristics.

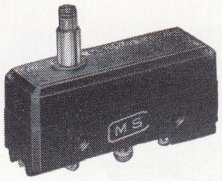
OPERATING CHARACTERISTICS

Operating Force	7 to 9 oz.	Reset Oper. Force	2 to 10 oz.
Overtravel	.005 to .010 in.	Reset Overtravel	.015 in. min.
Weight	.055 lb. approx.		



.012
P.T.
.917
.094 DIA
.625
O.P.
.840
.375
RESET F. P.
.560
.281
RESET O. P.
1.000
.470
.687
1.940
.250 DIA PLASTIC
RESET PLUNGER

NOTE -
⚠ MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS



BZ-RSX

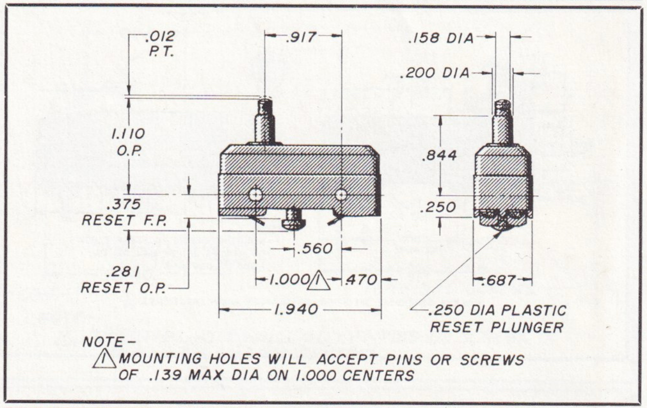
See page 3 for circuit variations. Solder type terminals only.

OVERTRAVEL PLUNGER

This switch is for use with in-line operating motion. Although the cover plunger permits 1/16 inch overtravel, the operating characteristics are closely held.

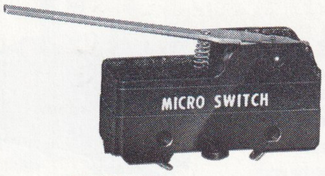
OPERATING CHARACTERISTICS

Operating Force	7 to 9½ oz.	Reset Oper. Force	2 to 10 oz.
Overtravel	.025 in. min.	Reset Overtravel	.015 in. min.
Weight	.058 lb. approx.		



.012
P.T.
.917
.158 DIA
.200 DIA
1.110
O.P.
.844
.375
RESET F.P.
.250
.560
.281
RESET O.P.
1.000
.470
.687
1.940
.250 DIA PLASTIC
RESET PLUNGER

NOTE -
⚠ MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS



MICRO SWITCH

BZ-RW80X

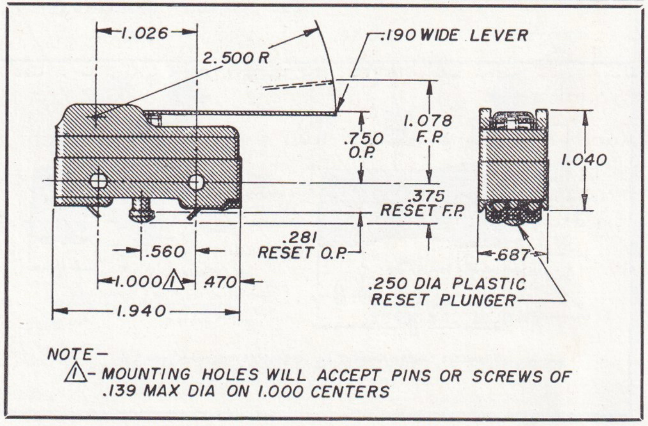
See page 3 for circuit variations. Solder type terminals only.

RIGID LEVER

The flat rigid lever permits operation with slow cams and slides with very low operating force. The lever can be bent to suit the user's needs.

OPERATING CHARACTERISTICS

Operating Force	2¼ oz. max.	Reset Oper. Force	2 to 10 oz.
Overtravel	.219 in. min.	Reset Overtravel	.015 in. min.
Weight	.065 lb. approx.		



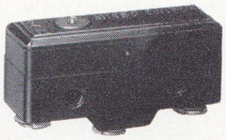
1.026
2.500 R
.190 WIDE LEVER
.750
O.P.
1.078
F.P.
1.040
.375
RESET F.P.
.281
RESET O.P.
.560
1.000
.470
.687
1.940
.250 DIA PLASTIC
RESET PLUNGER

NOTE -
⚠ - MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS

NOTE: Dimensions shown in this catalog are subject to change. Current Drawings will be supplied by your nearest MICRO SWITCH branch office.

Sensitive High Capacity — Type "M"

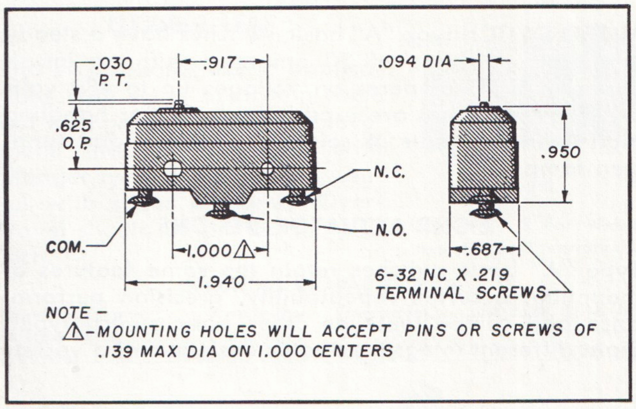
PIN PLUNGER



BM-1R-A2 Consult branch office for further information.

MICRO SWITCH Type "M" switches are designed to handle high capacity loads without sacrificing accurate repeatability and precision performance. They are similar in appearance and construction to MICRO SWITCH Type "Z" basic switches, and handle up to 35 ampere inrush currents from solenoids and motors. Type "M" switches are listed by Underwriters' Laboratories and are CSA certified.

Catalog Listing BM-1R-A2 has a pin plunger for application where operating motion and overtravel are limited. The screw terminals with cup washers are convenient for either stranded or solid wire.


.030
P.T.
.917
.094 DIA
.625
O.P.
.950
N.C.
N.O.
COM.
1.000 ⚠
.687
1.940
6-32 NC X .219
TERMINAL SCREWS

NOTE –
⚠–MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS

OPERATING CHARACTERISTICS

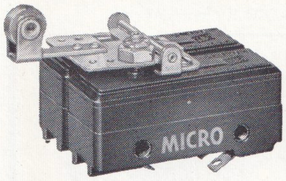
Release Force ....4 oz. min.
Operating Force ....7-10 oz.
Diff. Travel ....001 in. max.
Overtravel .... .005 in. min.
Break Distance .... .010 in. min.

ELECTRICAL RATING

22 amperes, 125, 250 or 480 volts a-c; ¼ H.P. 125 volts a-c; ½ H.P. 250 volts a-c.

Single Actuated Dual Switch

ROLLER-LEVER



6AS13

Catalog Listing 6AS13 consists of two single-pole double-throw switches operated by a single roller-lever actuator. Operating point of one of the basic switches is field adjustable to either simultaneous or sequence actuation.

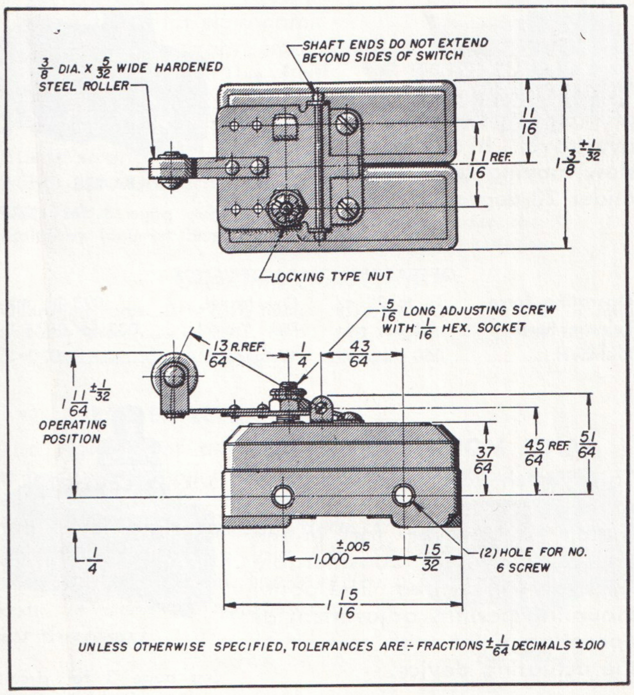
The 6AS13 can be supplied in a variety of lever lengths, with either a straight or formed lever, and with or without the roller on the lever. The basic switches in this assembly can be furnished in a choice of contact arrangements and electrical ratings. In addition to the solder type terminals illustrated above, both side and bottom facing screw terminals are also available.

Another single actuated dual switch (Catalog Listing 6AS18) has two adjusting screws, one above each switch plunger. This provides field adjustment of the operating points of both switches. More information on this and other dual switches can be obtained from the nearest MICRO SWITCH Branch Office.

ELECTRICAL RATING

The switching units of Catalog Listing 6AS13 have the following Underwriters' Laboratories listing:

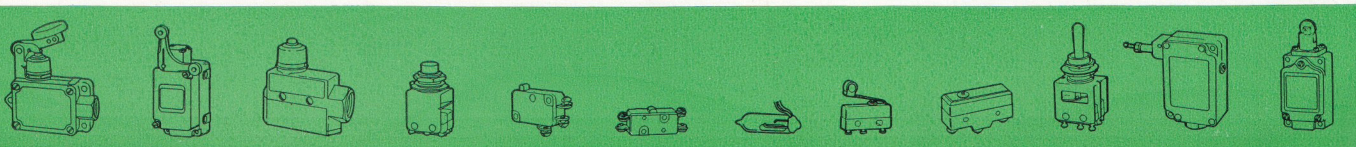
15 amperes 125, 250 or 480 volts a-c; ½ ampere 125 volts d-c; ¼ ampere 250 volts d-c.


3/8 DIA. X 5/32 WIDE HARDENED STEEL ROLLER
SHAFT ENDS DO NOT EXTEND BEYOND SIDES OF SWITCH
11/16
11/16 REF.
1 3/8 ±1/32
LOCKING TYPE NUT
5/16 LONG ADJUSTING SCREW WITH 1/16 HEX. SOCKET
1 13/64 R.REF.
1/4
43/64
1 11/64 ±1/32
OPERATING POSITION
37/64
45/64 REF.
51/64
1/4
±.005
1.000
15/32
(2) HOLE FOR NO. 6 SCREW
1 15/16

UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE÷ FRACTIONS $\pm\frac{1}{64}$ DECIMALS ±.010

OPERATING CHARACTERISTICS

Operating Force ....8 oz. max.
Release Force ....½ oz. min.
Overtravel .... .020 in. min.
Diff. travel .... .109 in. max.



General Purpose Switches - Type "A"

MICRO SWITCH type "A" basic switches have a steady state current rating of 20 amperes, with an inrush capacity of 75 amperes on voltages up to 480 volts a-c. These switches are especially useful for handling high inrush currents of solenoids, motors, and tungsten lamps.

EIGHT ACTUATOR DESIGNS

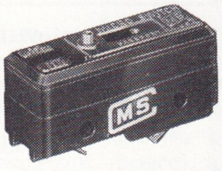
Type "A" basic switches retain the same features of mounting, accurate repeatability, precision performance and compactness as other basic switch types. Eight different integral actuator designs and a variety of operating characteristics are offered. The plastic case of each switch differs only in respect to its actuator.

ELECTRICAL RATING

Underwriters' Laboratories, Inc. lists type "A" switches for: 20 amperes, 125, 250 or 480 volts a-c; 10 amperes, 125 volts a-c, "L" (suitable for controlling tungsten filament lamp loads on a-c circuits); ¼ ampere, 250 volts d-c, ½ ampere, 125 volts d-c; 1 H. P., 125 volts a-c; 2 H. P., 250 volts a-c.

PIN PLUNGER

This switch is for applications requiring limited overtravel, compactness and closely held operating characteristics.

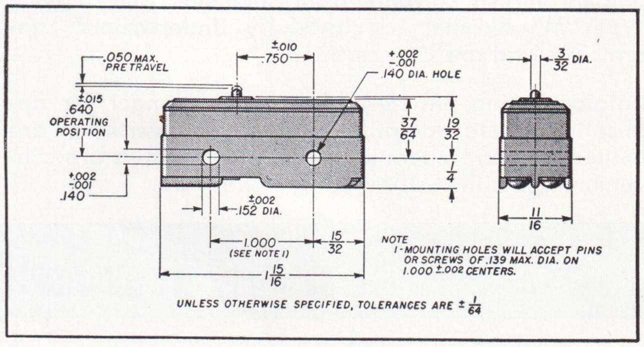


BA-2R

See page 3 for circuit and terminal variations.

OPERATING CHARACTERISTICS

Operating Force	14 to 22 oz.	Overtravel	.010 in. min.
Release Force	10 oz. min.	Diff. Travel	.002 to .0075 in.
Pretravel	.050 in. max.	Weight	.063 lb.

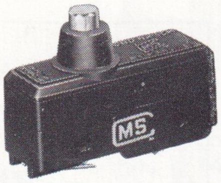

.050 MAX. PRETRAVEL
±.010 .750
+.002 -.001 .140 DIA. HOLE
3/32 DIA.
±.015 .640 OPERATING POSITION
37/64
19/32
1/4
+.002 -.001 .140
±.002 .152 DIA.
11/16
1.000 (SEE NOTE 1)
15/32
1 15/16

NOTE
1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000 ±.002 CENTERS.

UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE ± 1/64

OVERTRAVEL PLUNGER

This switch has a large diameter plunger which allows 1/16 inch overtravel. It can be used with slow moving cams whose rise is under 20 degrees.

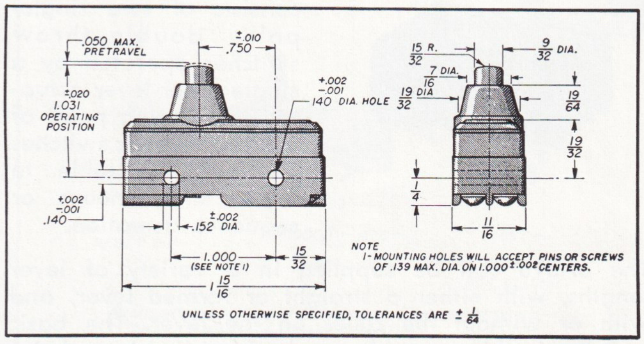


BA-2RB

See page 3 for circuit and terminal variations.

OPERATING CHARACTERISTICS

Operating Force	14 to 22 oz.	Overtravel	.093 in. min.
Release Force	10 oz. min.	Diff. Travel	.002 to .0075 in.
Pretravel	.050 in. max.	Weight	.070 lb.

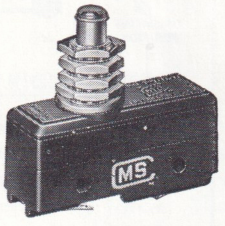

.050 MAX. PRETRAVEL
±.010 .750
±.020 1.031 OPERATING POSITION
+.002 -.001 .140 DIA. HOLE
15/32 R.
9/32 DIA.
7/16 DIA.
19/32 DIA
19/64
19/32
1/4
+.002 -.001 .140
±.002 .152 DIA.
11/16
1.000 (SEE NOTE 1)
15/32
1 15/16

NOTE
1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000±.002 CENTERS.

UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE ± 1/64

PANEL MOUNT PLUNGER

This switch can be used as a manual or mechanical pushbutton switch, or for in-line operation when considerable overtravel is desired. The panel mounting permits adjustment of operating point with respect to the actuating device.

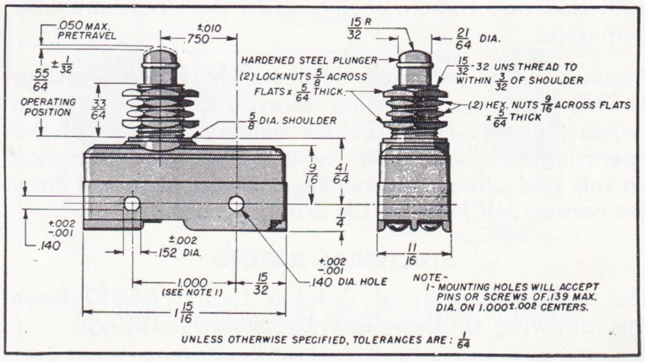


BA-2RQ1

See page 3 for circuit and terminal variations.

OPERATING CHARACTERISTICS

Operating Force	14 to 22 oz.	Overtravel	.219 in. min.
Release Force	10 oz. min.	Diff. Travel	.002 to .0075 in.
Pretravel	.050 in. max.	Weight	.093 lb.

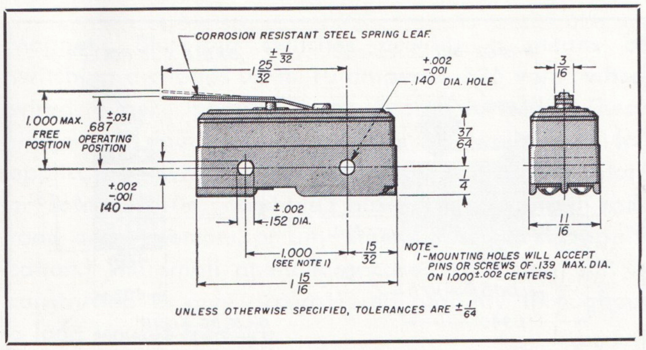

.050 MAX. PRETRAVEL
±.010 .750
55/64 ± 1/32
OPERATING POSITION
33/64
15/32 R
21/64 DIA.
HARDENED STEEL PLUNGER
(2) LOCKNUTS 5/8 ACROSS FLATS x 5/64 THICK
15/32-32 UNS THREAD TO WITHIN 3/32 OF SHOULDER
(2) HEX. NUTS 9/16 ACROSS FLATS x 5/64 THICK
5/8 DIA. SHOULDER
9/16
41/64
1/4
+.002 -.001 .140
±.002 .152 DIA.
+.002 -.001 .140 DIA. HOLE
11/16
1.000 (SEE NOTE 1)
15/32
1 15/16

NOTE-
1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000±.002 CENTERS.

UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE : 1/64

NOTE: Dimensions shown in this catalog are subject to change. Current Drawings will be supplied by your nearest MICRO SWITCH branch office.

General Purpose Switches - Type "A" (cont.)

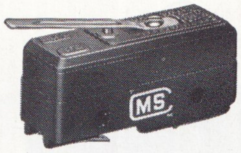

CORROSION RESISTANT STEEL SPRING LEAF
1 25/32 ± 1/32
+.002 −.001 .140 DIA. HOLE
3/16
1.000 MAX. FREE POSITION
.687 ±.031 OPERATING POSITION
37/64
1/4
+.002 −.001 .140
±.002 .152 DIA.
11/16
1.000 (SEE NOTE 1)
15/32
1 15/16

NOTE-
1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000 ±.002 CENTERS.

UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE ± 1/64

FLEXIBLE LEAF

This switch is for use in applications with small operating force but with greater actuating movement than is required with plunger type switches. It is useful with slides or cams. Overtravel should be limited to 1/16 inch.

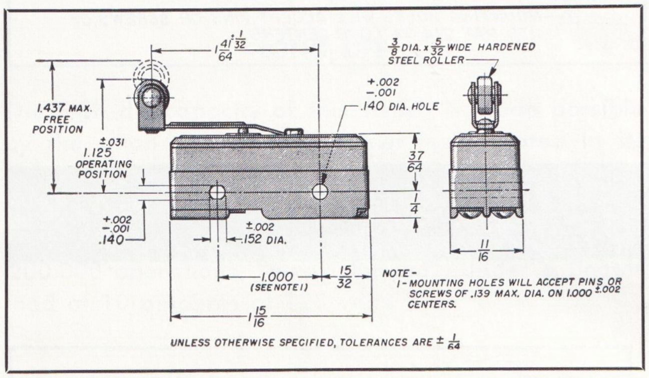


BA-2RL

See page 3 for circuit and terminal variations.

OPERATING CHARACTERISTICS

Operating Force	9 oz. max.	Overtravel	not over 1/16 in.
Release Force	1 oz. min.	Diff. Travel	.065 in. max.
Pretravel	11/32 in. max.	Weight	.063 lb.

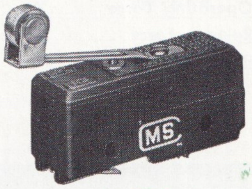

1 41/64 ± 1/32
3/8 DIA. x 5/32 WIDE HARDENED STEEL ROLLER
+.002 −.001 .140 DIA. HOLE
1.437 MAX. FREE POSITION
1.125 ±.031 OPERATING POSITION
37/64
1/4
+.002 −.001 .140
±.002 .152 DIA.
11/16
1.000 (SEE NOTE 1)
15/32
1 15/16

NOTE-
1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000 ±.002 CENTERS.

UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE ± 1/64

ROLLER LEAF

This switch is for use with fast slides or cams with small force and relatively large operating movement. Recommended limit of overtravel is 1/16 inch.

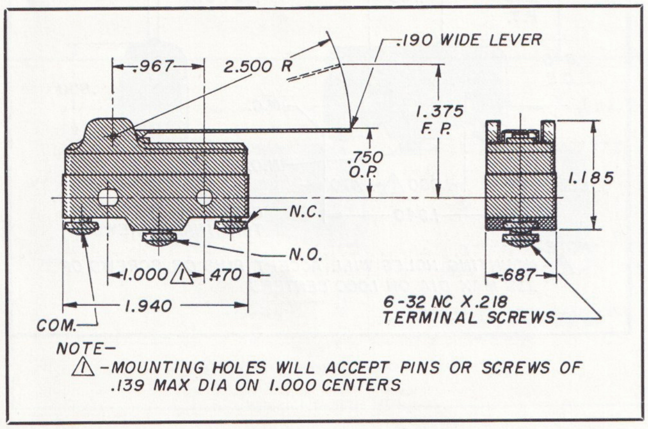


BA-2RL2

See page 3 for circuit and terminal variations.

OPERATING CHARACTERISTICS

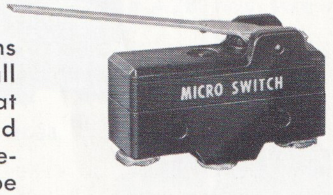
Operating Force	9 oz. max.	Overtravel	not over 1/16 in.
Release Force	1 oz. min.	Diff. Travel	.065 in. max.
Weight	.073 lb.		


.190 WIDE LEVER
.967
2.500 R
1.375 F.P.
.750 O.P.
1.185
N.C.
N.O.
1.000
.470
.687
1.940
6-32 NC X.218 TERMINAL SCREWS
COM.

NOTE–
△ -MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS

RIGID LEVER

This switch is for slow cams or slides with very small operating force. The flat lever actuator is rigid enough to provide adequate strength, yet may be bent for adjustments by the user.

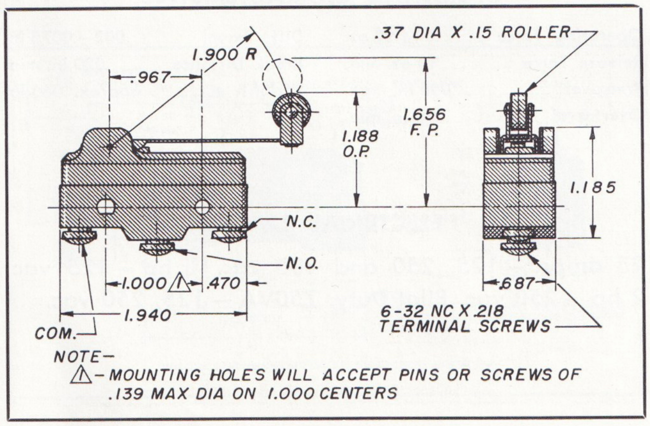

MICRO SWITCH

BA-2RV-A2

See page 3 for circuit and terminal variations.

OPERATING CHARACTERISTICS

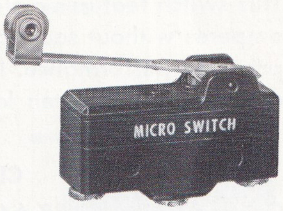
Operating Force	2-1/2 oz. max.	Overtravel	.078 in. min.
Release Force	1/2 oz. min.	Diff. Travel	.109 in. max.
Pretravel	5/8 in. max.	Weight	.073 lb.


.37 DIA X .15 ROLLER
1.900 R
.967
1.188 O.P.
1.656 F.P.
1.185
N.C.
N.O.
1.000
.470
.687
1.940
6-32 NC X .218 TERMINAL SCREWS
COM.

NOTE–
△ - MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS

ROLLER LEVER

The rigid lever actuator has a hardened steel roller which particularly suits this switch for fast cam operation where operating force is low but movement is liberal. The lever can be bent for adjustment by the user.

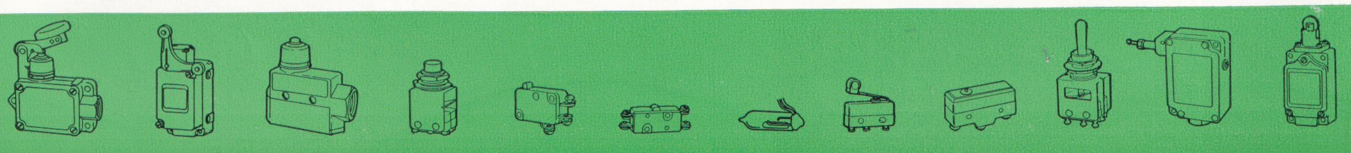

MICRO SWITCH

BA-2RV2-A2

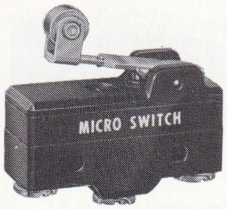
See page 3 for circuit and terminal variations.

OPERATING CHARACTERISTICS

Operating Force	2-1/2 oz. max.	Overtravel	1/16 in. min.
Release Force	1/2 oz. min.	Diff. Travel	.085 in. max.
Pretravel	15/32 in. max.	Weight	.080 lb.



General Purpose Switches - Type "A" (cont.)

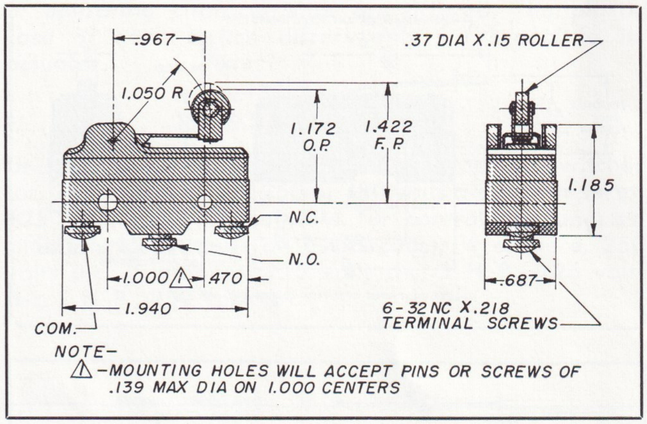


BA-2RV22-A2

See page 3 for circuit and terminal variations.

SHORT ROLLER LEVER

This compact design has a hardened steel roller on a short rigid lever for actuation by fast rotating cams and similar devices.



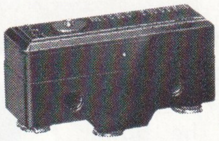
NOTE–
⚠–MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS

OPERATING CHARACTERISTICS

Operating Force	6 oz. max.	Overtravel	1⁄32 in. min.
Release Force	1½ oz. min.	Diff. Travel	3⁄64 in. max.
Pretravel	¼ in. max.	Weight	.075 lb.

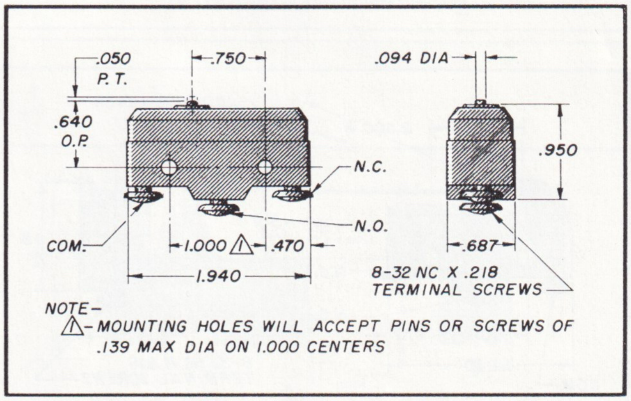
25 Ampere Switch - Type "E"

PIN PLUNGER



BE-2R-A4

Consult branch office for further information.



NOTE–
⚠–MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000 CENTERS

Catalog Listing BE-2R-A4 has a pin plunger for applications having a limited overtravel, and requiring compactness and closely held operating characteristics. Bottom-facing 8-32 NC x .218 binder head screw terminals and cup washers provide convenient connection of either stranded or solid wire.

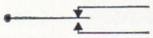
This switch features a steady state current rating of 25 amperes without sacrificing accurate repeatability and precision performance. It handles high inrush currents of solenoids, tungsten lamps and motors.

OPERATING CHARACTERISTICS

Operating Force	14-22 oz.	Diff. Travel	.002—.0075 in.
Release Force	10 oz. min.	Break Distance	.020 in. min.
Pretravel	.050 in. max.	Weight	approx. .060 lb.
Overtravel	.010 in. min.		

CIRCUITRY

Catalog listing BE-2R-A4 has a single-pole double-throw contact arrangement. It is listed by Underwriters' Laboratories, Inc.



ELECTRICAL RATING

25 amps. — 125, 250 and 480 vac. 1 hp — 125 vac, 2 hp — 250 vac. Pilot Duty: 750VA — 125, 250 vac.

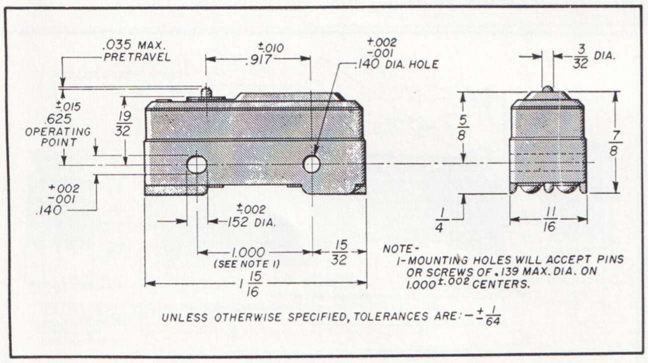
NOTE: Dimensions shown in this catalog are subject to change. Current Drawings will be supplied by your nearest MICRO SWITCH branch office.

Magnetic Blow-out Switches

Magnetic Blow-out switches provide a means of switching d-c loads up to 10 amperes, 125 volts, when wired either "polarized" or "non-polarized". These single-pole double-throw switches are well suited for applications which require flexible control of motors or solenoids (ie; airplane, buses, automobiles, railroad and streetcars, or any other direct current application.) The small phenolic encased switching unit is constructed to give accurate repeatability throughout a long trouble-free life.

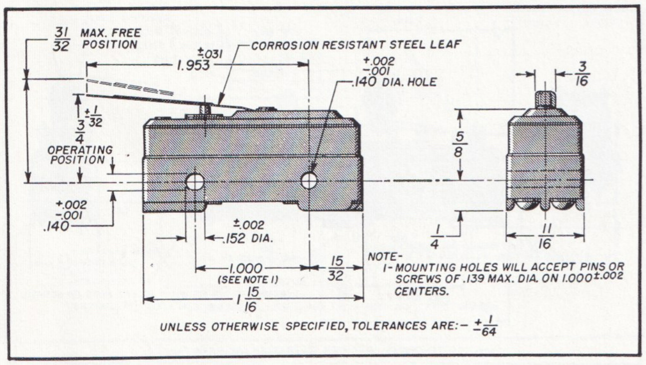
LONG LIFE

The high d-c capacity of this switch is made possible by the small permanent magnet incorporated in its design. This magnet protects the contacts when the circuit is broken by blowing the d-c arc away from them. Tests indicate an average life expectancy of 200,000 operations, "non-polarized", under a heater load of 10 amperes at 125 volts.


.035 MAX. PRETRAVEL
±.010 .917
+.002 -.001 .140 DIA. HOLE
3/32 DIA.
±.015 .625 OPERATING POINT
19/32
5/8
7/8
+.002 -.001 .140
±.002 .152 DIA.
1/4
11/16
1.000 (SEE NOTE 1)
15/32
1 15/16

NOTE- 1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000±.002 CENTERS.

UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE: – ±1/64


31/32 MAX. FREE POSITION
±.031 1.953
CORROSION RESISTANT STEEL LEAF
+.002 -.001 .140 DIA. HOLE
3/16
±1/32 3/4 OPERATING POSITION
5/8
+.002 -.001 .140
±.002 .152 DIA.
1/4
11/16
1.000 (SEE NOTE 1)
15/32
1 15/16

NOTE- 1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000±.002 CENTERS.

UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE: – ±1/64

ELECTRICAL RATINGS

"Non-Polarized"

Volts d-c	Motor	Inductive	Resistive
125	¼ H. P.	*	10 Amperes
250	*	*	1.5 to 3.0 Amperes

"Polarized"

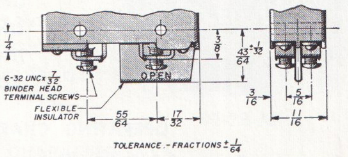
If polarization is required, connect the negative side of the line to the common terminal of the switch. An alternate method is to mount the switch with brass screws and space switch (with a non-magnetic material) at least ¼ inch away from magnetic materials.

Volts d-c	Motor	Inductive	Resistive
125	½ H. P.	*	10 Amperes
250	*	*	1.5 to 3.0 Amperes

* Contact the nearest MICRO SWITCH branch office.

TERMINAL VARIATIONS

Magnetic Blow-out switches are available with either solder terminals or binder head screw terminals. Screw terminal "MT" switches are ordered by adding the designation "A28" to the solder terminal catalog listing, (Example: MT-4R-A28 has screw terminals.)


1/4
6-32 UNC x 7/32 BINDER HEAD TERMINAL SCREWS
FLEXIBLE INSULATOR
OPEN
55/64
17/32
3/8
43/64 ±1/32
3/16
5/16
11/16

TOLERANCE.-FRACTIONS ±1/64

"A28" Terminals

PIN PLUNGER

Catalog Listing MT-4R is a "pin" plunger switch for use in applications which permit only limited plunger overtravel.

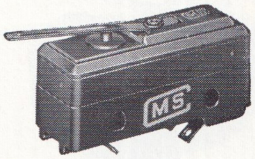
MT-4R

OPERATING CHARACTERISTICS

Operating Force ....12 to 18 oz.
Overtravel ....005 in. min.
Release Force ....5 oz. min.
Diff. Travel ....007 in. max.
Weight ....060 lb.

FLEXIBLE LEAF

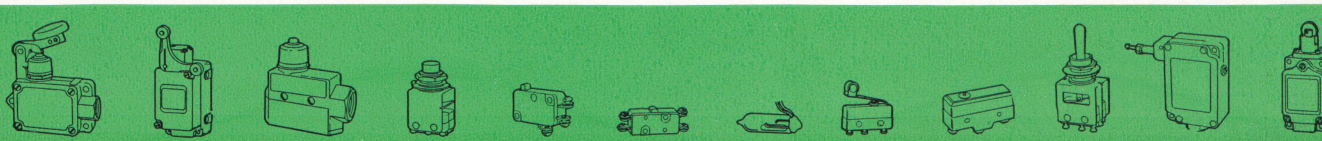
Catalog Listing MT-4RL has a flexible leaf actuator for use with sliding or rotating cams. The operating force is very light.



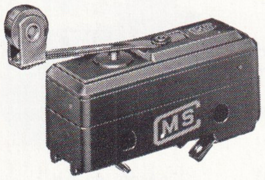
MT-4RL

OPERATING CHARACTERISTICS

Operating Force .....12 oz. max.
Overtravel ....062 in. max.
Release Force ....1 oz. min.
Weight ....061 lb.



Magnetic Blow-out Switches (cont.)



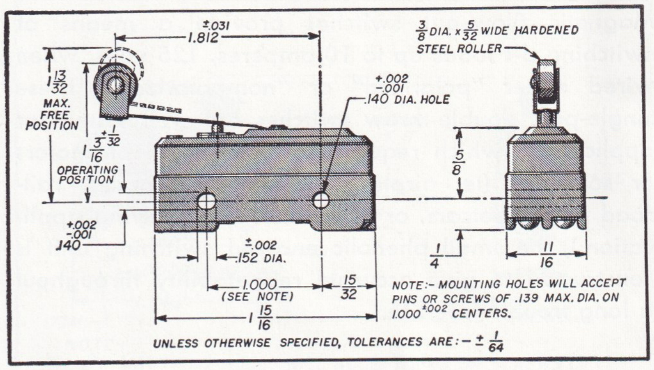
MT-4RL2

ROLLER LEAF

Catalog Listing MT-4RL2 has a flexible roller-leaf actuator for use with slow moving cams or slides. The operating force is very light.

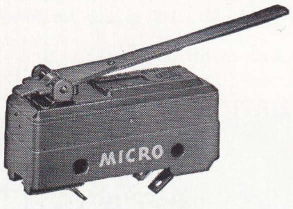
OPERATING CHARACTERISTICS

Operating Force	12 oz. max.	Overtravel	.062 in. max.
Release Force	1 oz. min.	Weight	.070 lb.


±.031
1.812
$\frac{3}{8}$ DIA. x $\frac{5}{32}$ WIDE HARDENED STEEL ROLLER
$1\frac{13}{32}$ MAX. FREE POSITION
+.002 −.001 .140 DIA. HOLE
$1\frac{3}{16}\pm\frac{1}{32}$ OPERATING POSITION
$\frac{5}{8}$
+.002 −.001 .140
±.002 .152 DIA.
$\frac{1}{4}$
$\frac{11}{16}$
1.000 (SEE NOTE)
$\frac{15}{32}$
$1\frac{15}{16}$

NOTE:- MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON $1.000^{\pm.002}$ CENTERS.

UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE:− $\pm\frac{1}{64}$



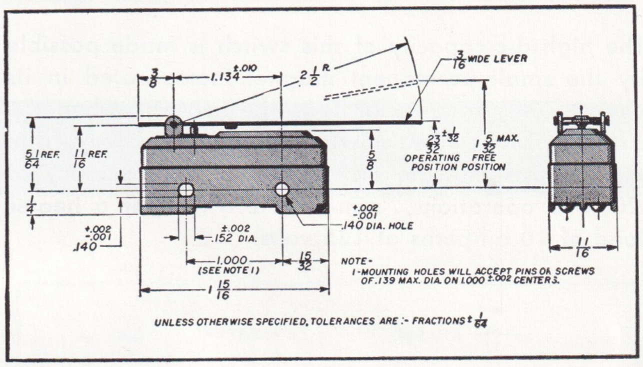
MT-4RV

RIGID LEVER

Catalog Listing MT-4RV has a rigid lever actuator, suitable for operation by cams or slides. The operating force is extremely light and the lever may be bent for adjustment in the field.

OPERATING CHARACTERISTICS

Operating Force	2-1/2 oz. max.	Overtravel	.047 in. min.
Release Force	1/2 oz. min.	Diff. Travel	.085 in. max.
Weight	.068 lb.		


$\frac{3}{8}$
±.010
1.134
$2\frac{1}{2}$ R.
$\frac{3}{16}$ WIDE LEVER
$\frac{51}{64}$ REF.
$\frac{11}{16}$ REF.
$\frac{5}{8}$
$\frac{23}{32}\pm\frac{1}{32}$ OPERATING POSITION
$1\frac{5}{32}$ MAX. FREE POSITION
$\frac{1}{4}$
+.002 −.001 .140
±.002 .152 DIA.
+.002 −.001 .140 DIA. HOLE
1.000 (SEE NOTE 1)
$\frac{15}{32}$
$1\frac{15}{16}$
$\frac{11}{16}$

NOTE-
1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON $1.000^{\pm.002}$ CENTERS.

UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE :- FRACTIONS $\pm\frac{1}{64}$

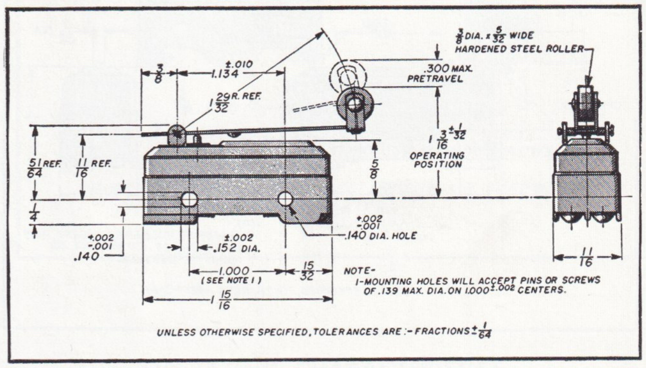
MT-4RV2

ROLLER LEVER

Catalog Listing MT-4RV2 has a rigid roller-lever actuator suitable for actuation by cams, where the operating force is low and the operating movement is liberal. The lever may be bent for adjustment.

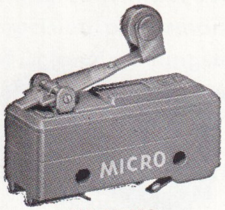
OPERATING CHARACTERISTICS

Operating Force	3 oz. max.	Overtravel	.031 in. min.
Release Force	1/4 oz. min.	Diff. Travel	.065 in. max.
Weight	.071 lb.		


$\frac{3}{8}$ DIA. x $\frac{5}{32}$ WIDE HARDENED STEEL ROLLER
$\frac{3}{8}$
±.010
1.134
$1\frac{29}{32}$ R. REF.
.300 MAX. PRETRAVEL
$1\frac{3}{16}\pm\frac{1}{32}$ OPERATING POSITION
$\frac{51}{64}$ REF.
$\frac{11}{16}$ REF.
$\frac{5}{8}$
$\frac{1}{4}$
+.002 −.001 .140
±.002 .152 DIA.
+.002 −.001 .140 DIA. HOLE
1.000 (SEE NOTE 1)
$\frac{15}{32}$
$1\frac{15}{16}$
$\frac{11}{16}$

NOTE-
1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON $1.000^{\pm.002}$ CENTERS.

UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE :- FRACTIONS $\pm\frac{1}{64}$



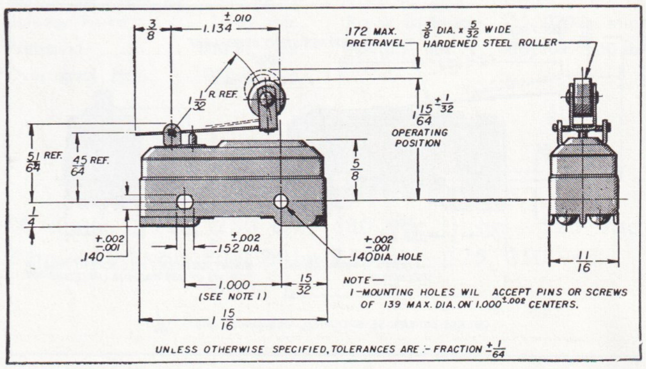
MT-4RV22

SHORT ROLLER LEVER

Catalog Listing MT-4RV22 has a hardened steel roller on a short rigid lever. It is suitable for actuation by fast rotating cams and similar devices.

OPERATING CHARACTERISTICS

Operating Force	4-1/2 oz. max.	Overtravel	.015 in. min.
Release Force	1 oz. min.	Diff. Travel	.035 in. max.
Weight	.069 lb.		

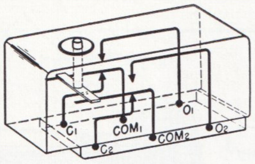

$\frac{3}{8}$
±.010
1.134
.172 MAX. PRETRAVEL
$\frac{3}{8}$ DIA. x $\frac{5}{32}$ WIDE HARDENED STEEL ROLLER
$1\frac{1}{32}$ R. REF.
$1\frac{15}{64}\pm\frac{1}{32}$ OPERATING POSITION
$\frac{51}{64}$ REF.
$\frac{45}{64}$ REF.
$\frac{5}{8}$
$\frac{1}{4}$
+.002 −.001 .140
±.002 .152 DIA.
+.002 −.001 .140 DIA. HOLE
1.000 (SEE NOTE 1)
$\frac{15}{32}$
$1\frac{15}{16}$
$\frac{11}{16}$

NOTE—
1-MOUNTING HOLES WIL ACCEPT PINS OR SCREWS OF 139 MAX. DIA. ON $1.000^{\pm.002}$ CENTERS.

UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE :- FRACTION $\pm\frac{1}{64}$

NOTE: Dimensions shown in this catalog are subject to change. Current Drawings will be supplied by your nearest MICRO SWITCH branch office.

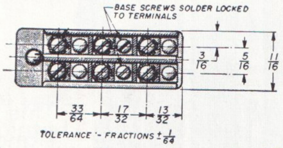
Double-Pole Double-Throw Switches


C1
COM1
C2
COM2
O1
O2

Double-Pole Double-Throw switches simultaneously make and break two independent circuits. This double-throw contact arrangement provides a normally-open and a normally-closed contact for each pole, permitting several wiring combinations.

In size, plunger location and mounting facilities Double-Pole Double-Throw switches are approximately interchangeable with other types shown in this catalog. The double-pole feature in this equivalent size offers a definite advantage where space and weight limitations are critical.

TERMINALS

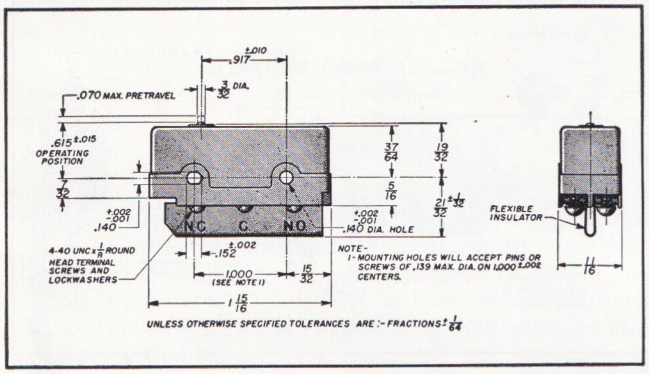

BASE SCREWS SOLDER LOCKED TO TERMINALS
3/16
5/16
11/16
33/64
17/32
13/32
TOLERANCE :- FRACTIONS ±1/64

Terminals on all "DT" switches have 4-40x1/8 inch screws and lockwashers. They are positioned in pairs of normally-closed, common and normally-open. A fibre glass insulator is used on all Double-Pole Double-Throw switches to isolate the terminals from accidental shorting when wiring. Terminal designations (N.C., C. and N.O.) are plainly marked on either side of the insulator.

ELECTRICAL RATINGS

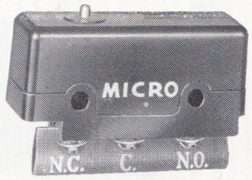
Underwriters' Laboratories, Inc. lists all MICRO SWITCH Double-Pole Double-Throw switches for 10 amperes 125 or 250 volts a-c; 0.3 ampere 125 volts d-c; 0.15 ampere 250 volts d-c.

Temperature rise limits maximum continuous current to 10 amperes per pole.


.917 ±.010
.070 MAX. PRETRAVEL
3/32 DIA.
.615 ±.015 OPERATING POSITION
37/64
19/32
5/16
21/32 ±1/32
3/32
+.002 -.001 .140
+.002 -.001 .140 DIA. HOLE
N.C.
C
N.O.
FLEXIBLE INSULATOR
4-40 UNC x 1/8 ROUND HEAD TERMINAL SCREWS AND LOCKWASHERS
.152 ±.002
1.000 (SEE NOTE 1)
15/32
1 15/16
11/16
NOTE - 1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000 ±.002 CENTERS.
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE :- FRACTIONS ±1/64

PIN PLUNGER

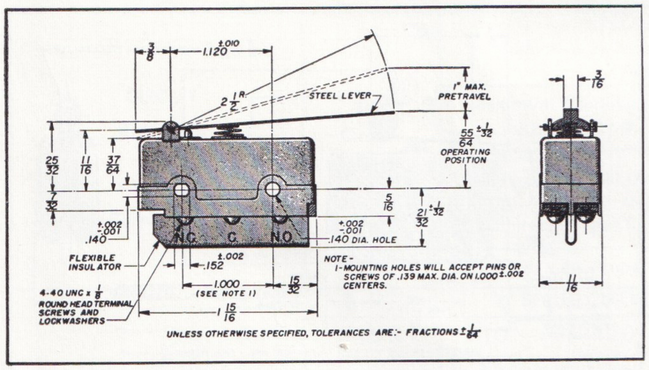
Pin plungers are for use in applications where the travel of the actuation mechanism is accurately controlled.

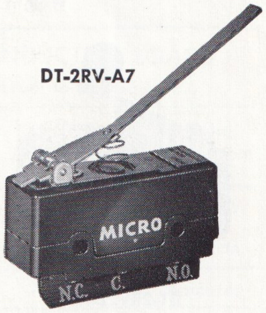

MICRO
N.C.
C.
N.O.

DT-2R-A7

OPERATING CHARACTERISTICS

Operating Force	12 to 20 oz.	Overtravel	.005 in. min.
Release Force	2 oz. min.	Diff. Travel	.035 to .055 in.
Pretravel	.070 in. max.	Weight	.070 lb.


3/8
1.120 ±.010
2 1/2 R.
STEEL LEVER
1" MAX. PRETRAVEL
3/16
55/64 ±1/32 OPERATING POSITION
25/32
11/16
37/64
3/32
5/16
21/32 ±1/32
+.002 -.001 .140
+.002 -.001 .140 DIA. HOLE
N.C.
C
N.O.
FLEXIBLE INSULATOR
4-40 UNC x 1/8 ROUND HEAD TERMINAL SCREWS AND LOCKWASHERS
.152 ±.002
1.000 (SEE NOTE 1)
15/32
1 15/16
11/16
NOTE - 1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000 ±.002 CENTERS.
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE :- FRACTIONS ±1/64


MICRO
N.C.
C.
N.O.

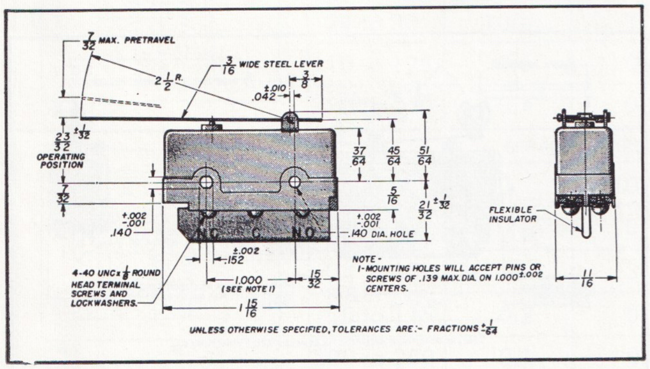
DT-2RV-A7

RIGID LEVER

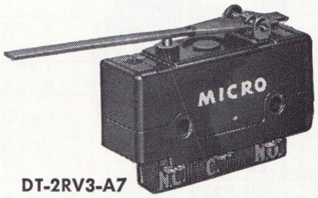
This straight lever actuator is suitable for actuation by slow moving cams or slides, when only a low actuating force is available.

OPERATING CHARACTERISTICS

Operating Force	3-1/2 oz.	Overtravel	.062 in. min.
Release Force	1 oz. min.	Diff. Travel	.422 to .687 in.
Pretravel	1.000 in. max.	Weight	.079 lb.


7/32 MAX. PRETRAVEL
3/16 WIDE STEEL LEVER
2 1/2 R.
.042 ±.010
3/8
2 3/32 ±1/32 OPERATING POSITION
37/64
45/64
51/64
3/32
5/16
21/32 ±1/32
+.002 -.001 .140
+.002 -.001 .140 DIA. HOLE
N.C.
C
N.O.
FLEXIBLE INSULATOR
4-40 UNC x 1/8 ROUND HEAD TERMINAL SCREWS AND LOCKWASHERS.
.152 ±.002
1.000 (SEE NOTE 1)
15/32
1 15/16
11/16
NOTE - 1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000 ±.002 CENTERS.
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE :- FRACTIONS ±1/64

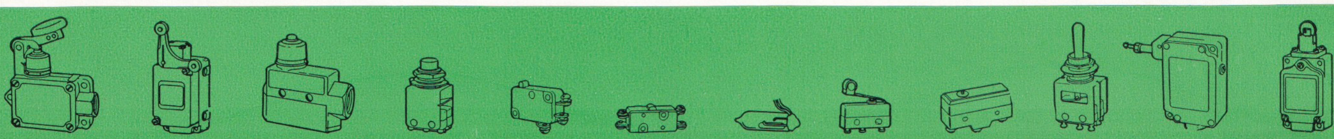
This switch has a straight lever actuator suitable for actuation by light force cams or slides. Reversed lever position gives decreased differential travel.


MICRO
N.C.
C.
N.O.

DT-2RV3-A7

OPERATING CHARACTERISTICS

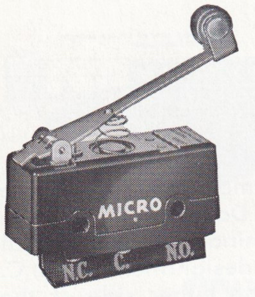
Operating Force	4 to 7 oz.	Overtravel	.015 in. min.
Release Force	1/2 oz. min.	Diff. Travel	.094 to .172 in.
Pretravel	7/32 in. max.	Weight	.079 lb.



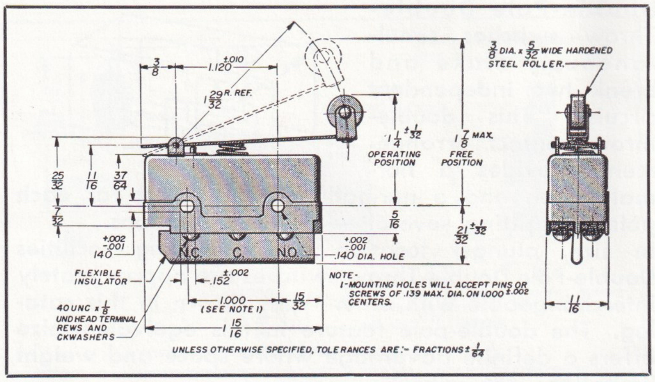
Double-Pole Double-Throw Switches (cont.)

ROLLER LEVER

This roller-lever actuator is designed for operation by low force cams in applications where operating movement is liberal.


MICRO
N.C.
C.
NO.

DT-2RV2-A7

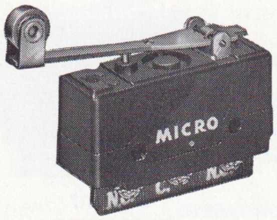

3/8
±.010
1.120
1 29/32 R. REF.
3/8 DIA. x 5/32 WIDE HARDENED STEEL ROLLER.
1 1/4 ±1/32 OPERATING POSITION
1 7/8 MAX. FREE POSITION
25/32
11/16
37/64
7/32
5/16
21/32 ±1/32
+.002 -.001 .140
+.002 -.001 .140 DIA. HOLE
N.C.
C.
NO.
FLEXIBLE INSULATOR
±.002 .152
1.000 (SEE NOTE 1)
15/32
1 15/16
40UNC x 1/8 UNDHEAD TERMINAL REWS AND CKWASHERS
NOTE- 1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000 ±.002 CENTERS.
11/16
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE :- FRACTIONS ± 1/64

OPERATING CHARACTERISTICS

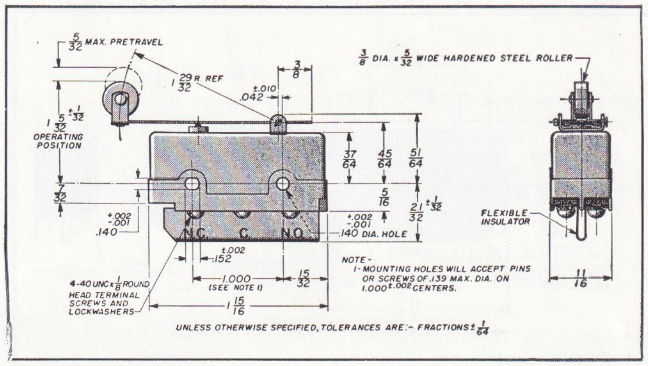
Oper. Force — 4-1/2 to 7-1/2 oz.
Release Force — 1-1/2 oz. min.
Overtravel — .047 in. min.
Diff. Travel — .312 to .515 in.
Weight — .085 lb.

LOW-TRAVEL ROLLER LEVER

This switch is for use with slow moving cams or slides. Reversed lever position gives decreased differential travel.



DT-2RV23-A7


5/32 MAX. PRETRAVEL
1 29/32 R. REF
3/8
±.010 .042
3/8 DIA. x 5/32 WIDE HARDENED STEEL ROLLER
1 5/32 ±1/32 OPERATING POSITION
7/32
37/64
45/64
51/64
5/16
21/32 ±1/32
+.002 -.001 .140
+.002 -.001 .140 DIA. HOLE
N.C.
C.
NO.
FLEXIBLE INSULATOR
±.002 .152
1.000 (SEE NOTE 1)
15/32
1 15/16
4-40 UNC x 1/8 ROUND HEAD TERMINAL SCREWS AND LOCKWASHERS
NOTE- 1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000 ±.002 CENTERS.
11/16
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE :- FRACTIONS ± 1/64

OPERATING CHARACTERISTICS

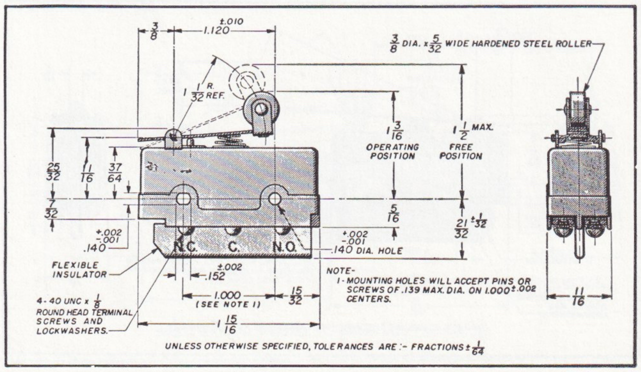
Oper. Force — 5-1/2 to 9-1/2 oz.
Release Force — 3/4 oz. min.
Overtravel — .010 in. min.
Diff. Travel — .070 to .130 in.
Weight — .085 lb.

SHORT ROLLER LEVER

This short roller-lever is suitable for actuation by rotating cams and is particularly useful in applications where space limitations are a deciding factor in the selection of a switch.

MICRO
NC.
C.
NO.

DT-2RV22-A7

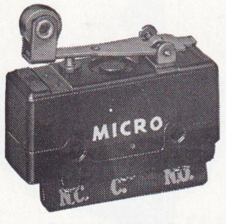

3/8
±.010
1.120
3/8 DIA. x 5/32 WIDE HARDENED STEEL ROLLER
1 1/32 R. REF.
1 3/16 OPERATING POSITION
1 1/2 MAX. FREE POSITION
25/32
11/16
37/64
7/32
5/16
21/32 ±1/32
+.002 -.001 .140
+.002 -.001 .140 DIA. HOLE
N.C.
C.
N.O.
FLEXIBLE INSULATOR
±.002 .152
1.000 (SEE NOTE 1)
15/32
1 15/16
4-40 UNC x 1/8 ROUND HEAD TERMINAL SCREWS AND LOCKWASHERS.
NOTE- 1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000 ±.002 CENTERS.
11/16
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE :- FRACTIONS ± 1/64

OPERATING CHARACTERISTICS

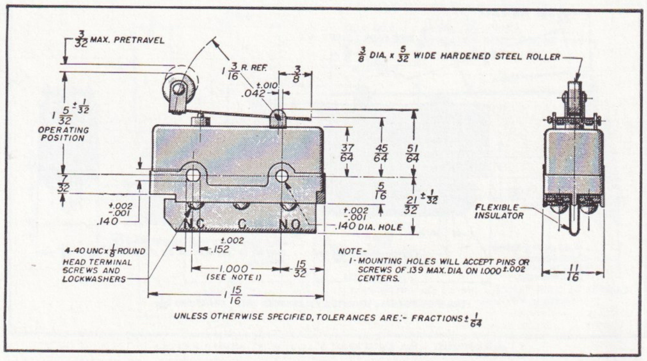
Operating Force — 9 to 14 oz.
Release Force — 3 oz. min.
Overtravel — .031 in. min.
Diff. Travel — .172 to .275 in.
Weight — .082 lb.

LOW-TRAVEL SHORT ROLLER LEVER

This switch has a short roller-lever for use with rotating cams. Reversed lever position gives decreased differential travel.


MICRO
NC.
C.
NO.

DT-2RV212-A7

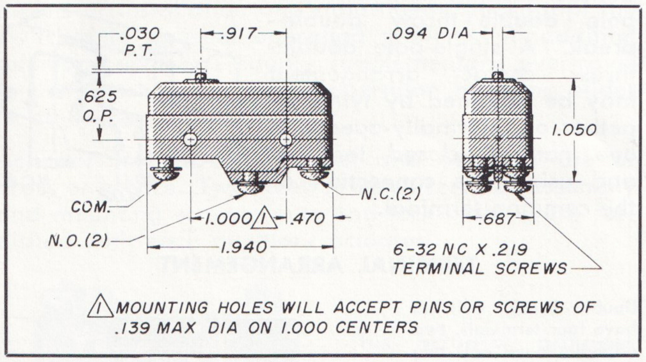

3/32 MAX. PRETRAVEL
1 3/16 R REF
3/8
±.010 .042
3/8 DIA. x 5/32 WIDE HARDENED STEEL ROLLER
1 5/32 ±1/32 OPERATING POSITION
7/32
37/64
45/64
51/64
5/16
21/32 ±1/32
+.002 -.001 .140
+.002 -.001 .140 DIA. HOLE
N.C.
C.
NO.
FLEXIBLE INSULATOR
±.002 .152
1.000 (SEE NOTE 1)
15/32
1 15/16
4-40 UNC x 1/8 ROUND HEAD TERMINAL SCREWS AND LOCKWASHERS
NOTE- 1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000 ±.002 CENTERS.
11/16
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE :- FRACTIONS ± 1/64

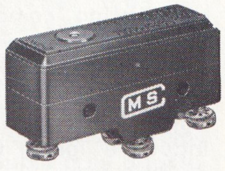
OPERATING CHARACTERISTICS

Operating Force — 9 to 15 oz.
Release Force — 1-1/2 oz. min.
Pretravel — .093 in. max.
Overtravel — .005 in. min.
Diff. Travel — .052 to .085 in.
Weight — .082 lb.

NOTE: Dimensions shown in this catalog are subject to change. Current Drawings will be supplied by your nearest MICRO SWITCH branch office.

Split Contact Switch





BZ-3YT

Catalog Listing BZ-3YT is a split-contact double-throw switch suitable for controlling two isolated circuits. This "pin" plunger switch (which conforms to Military Specifications MIL-S-6743, drawing AN3216-1) is for use where the means of actuation can be accurately controlled. Catalog Listing BZ-3YT has a double-throw contact arrangement and can be used as either a normally-open or normally-closed switch.

OPERATING CHARACTERISTICS

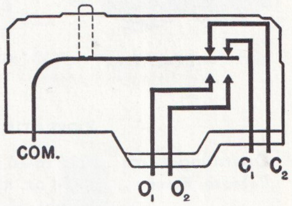
Operating Force	16 to 26 oz.	Pretravel	.030 in. max.
Release Force	4 oz. min.	Overtravel	.005 in. min.
Diff. Travel	.001 to .004 in.	Weight	.065 lb.

FOR SPECIAL APPLICATIONS

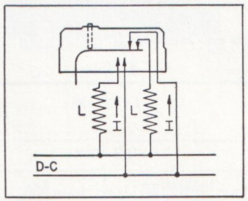
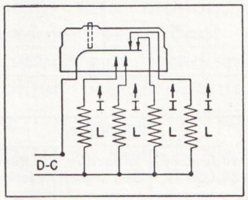
Split-contact switches are built for special applications and, because of their special construction, they have inherent limitations for general use. To avoid misapplication, MICRO SWITCH branch office engineers should be requested to review proposed uses for split-contact switches.

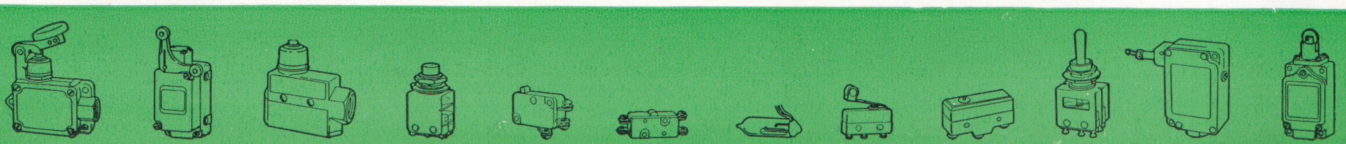
CONTACT ARRANGEMENT

Split-contact switches have double-throw contact arrangements. The normally-open terminal (o) and the normally-closed terminal (c) are alternately connected to the common terminal as the switch plunger is operated.



ELECTRICAL RATING

CIRCUIT DIAGRAM L = Load I = Current	D-c Circuit Voltage	INDUCTIVE LOADS Inductive ratings were determined by using AN3179 inductors.				NON-INDUCTIVE LOADS Sea Level to 50,000 feet		
		Maximum Continuous Current Rating		Maximum Permissible Starting Inrush		Heater Loads	Incandescent Filaments Maximum Heated Filament Loads	
		Sea Level to 20,000 feet	20,000 to 50,000 feet	Normally Closed Contacts	Normally Open Contacts		Normally Closed Contacts	Normally Open Contacts
	Volts	Amperes	Amperes	Amperes	Amperes	Amperes	Amperes	Amperes
SERIES CIRCUITS ("I" is current in each circuit as shown in sketches)								
 Fig. 1	6 to 8	10	10	40	20	10	3.0	1.5
	12 to 14	10	10			10	3.0	1.5
	24 to 30	10	5			10	3.0	1.5
	110 to 125	0.6	0.4			1	1.0	1.0
	220 to 250	0.4	0.3			0.6	0.6	0.6
SEPARATE CIRCUITS ("I" is current in each circuit as shown in sketches)								
 Fig. 2	6 to 8	10	10	40	20	10	3	1.5
	12 to 14	10	10			10	3	1.5
	24 to 30	4	3			10	3	1.5
	110 to 115	0.2	0.1			0.6	0.6	0.6
	220 to 250	0.1	0.05			0.3	0.3	0.3



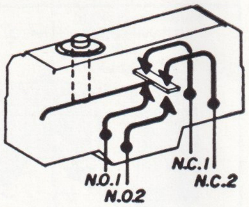
Double-Break Switches

Double-break switches make and break a circuit at two points. A silver bar, which is attached to the snap-spring, comes into contact with the two stationary contacts, providing a circuit path which completes the line circuit through the bar. This double-break feature effectively increases the contact break distance, which enables the switch to interrupt greater inductive loads than is possible with single-break switches.

Double-break switches are well suited for use as a control of two isolated circuits. The two circuits, one normally-open and one normally-closed, provide a feature useful in many special circuit problems.

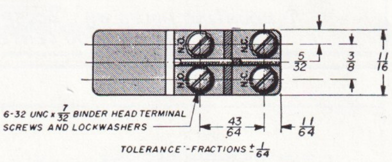
CONTACT ARRANGEMENT

Contact arrangement is single-pole double-throw double-break. A single-pole double-throw contact arrangement may be obtained by tying together one normally-open and one normally-closed terminal and using this connection as the common terminal.

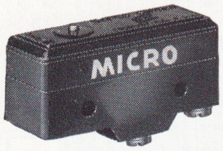

N.O.1
N.O.2
N.C.1
N.C.2

TERMINAL ARRANGEMENT

Double-break switches have four terminals, two normally-open and two normally-closed. The terminals have No. 6-32x 7/32 binder head screws and lockwashers.


N.O.
N.O.
N.C.
N.C.
6-32 UNC x 7/32 BINDER HEAD TERMINAL SCREWS AND LOCKWASHERS
5/32
3/8
11/16
43/64
11/64
TOLERANCE - FRACTIONS ± 1/64

PIN PLUNGER

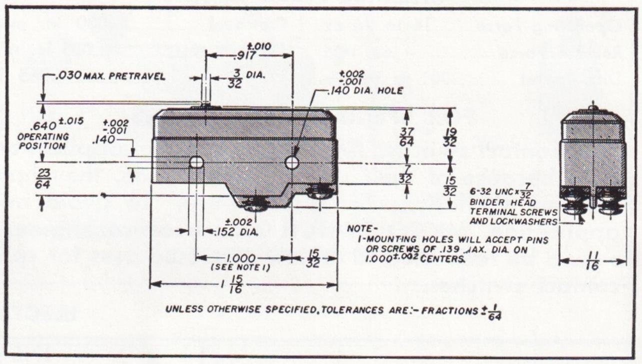


BZ-3AT

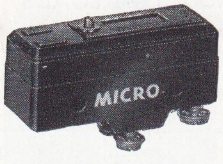
Catalog Listing BZ-3AT has a pin plunger actuator suiting it for applications requiring limited plunger overtravel, compactness and closely held operating characteristics.

OPERATING CHARACTERISTICS

Operating Force	16 to 26 oz.	Overtravel	.005 in. min.
Release Force	4 oz. min.	Diff. Travel	.002 to .005 in.
Weight	.062 lb.		


.030 MAX. PRETRAVEL
±.010
.917
3/32 DIA.
+.002 -.001
.140 DIA. HOLE
.640 ±.015 OPERATING POSITION
+.002 -.001 .140
23/64
37/64
19/32
7/32
15/32
6-32 UNC x 7/32 BINDER HEAD TERMINAL SCREWS AND LOCKWASHERS
±.002 .152 DIA.
NOTE-
1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000 ±.002 CENTERS.
1.000 (SEE NOTE 1)
15/32
1 15/16
11/16
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE:- FRACTIONS ± 1/64

PIN PLUNGER

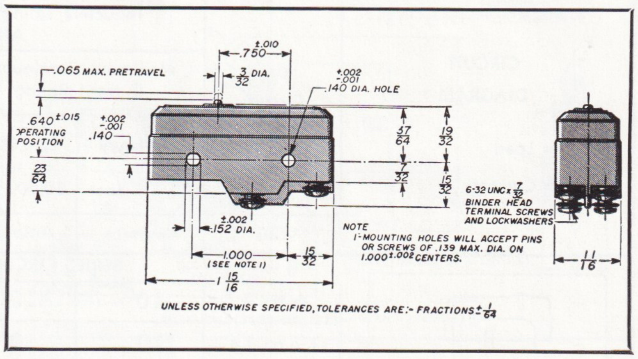


BA-3ST

Catalog Listing BA-3ST has a pin plunger and is similar in appearance to the BZ-3AT. The locations of the plungers of the two switches vary slightly, however.

OPERATING CHARACTERISTICS

Operating Force	26 to 38 oz.	Overtravel	.010 in. min.
Release Force	10 oz. min.	Diff. Travel	.007 to .015 in.
Weight	.067 lb.		


.065 MAX. PRETRAVEL
±.010
.750
3/32 DIA.
+.002 -.001
.140 DIA. HOLE
.640 ±.015 PERATING POSITION
+.002 -.001 .140
23/64
37/64
19/32
7/32
15/32
6-32 UNC x 7/32 BINDER HEAD TERMINAL SCREWS AND LOCKWASHERS
±.002 .152 DIA.
NOTE
1-MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX. DIA. ON 1.000 ±.002 CENTERS.
1.000 (SEE NOTE 1)
15/32
1 15/16
11/16
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE:- FRACTIONS ± 1/64

A-C CURRENT CAPACITY (AMPERES)

Catalog Listing	125 Volts			250 Volts			480 Volts	
	Motor Load	Resitive or Inductive Sea Level or 50,000 ft.		Resistive or Inductive Sea Level or 50,000 ft.		Motor Load	Inductive Sea Level	Resistive
		Temperature Rise of 30° C	Temperature Rise of 65° C	Rise of 30° C Temperature	Temperature Rise of 65° C			
BZ-3AT	¼ H.P.	15	30	15	30	½ H.P.	*	*
BA-3ST	¾ H.P.	25	35	25	35	1½ H.P.	25	25

D-C CURRENT CAPACITY (AMPERES)

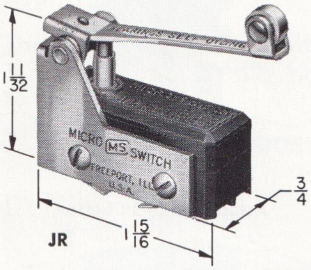
Catalog Listing	28 Volts				30 Volts			125 Volts			250 Volts		
	Inductive 50,000 ft.	Inductive Sea Level	Resistive	Heater	Inductive 50,000 ft.	Resistive	Motor Load	Inductive 50,000 ft.	Inductive Sea Level	Resistive	Inductive 50,000 ft.	Inductive Sea Level	Resistive
BZ-3AT	15	15	15	15	*	*	*	1	1	1.5	.5	.5	.75
BA-3ST	35	35	35	35	30	35	Make Break 75, 12.5	1	1	1.5	.5	.5	.75

*For these values, contact nearest branch office.

Auxiliary Switch Actuators

Auxiliary actuators provide basic switches with easy means of installation and adjustment, and adapt the switches to unusual operating motions. In addition auxiliary actuators supply supplementary overtravel to the switches, permitting operation by cams, slides or other mechanical means.

Actuator frames are of steel and bearings are of brass or bronze. Two screws (which serve as assembly and mounting screws) nuts and lockwashers are furnished with each auxiliary actuator.



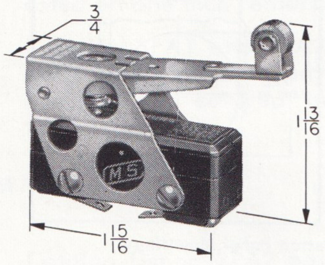
JR

This actuator provides supplementary overtravel to the switch and permits cam operation. For use with "S" plunger, type "Z" switches only.

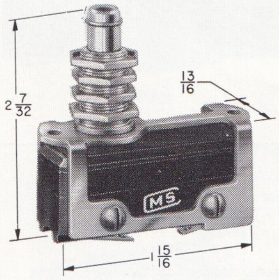
This roller actuator is for operation by fast moving cams or slides. Operating point and free position are field adjustable by bending the tang on the top of the actuator.

ADA3721R for type "A" switches

ADD3721R for double-pole double-throw switches



AD5721R



MC2711

This push plunger actuator is for operation by a straight line motion. Two thin hex nuts and lock nuts permit some adjustment of the operating point.

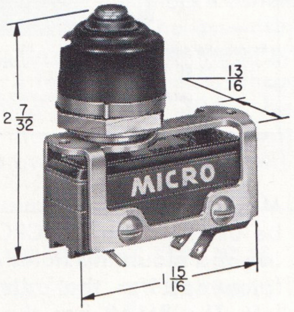
MCA2711 for type "A" switches

MCD2711 for double-pole double-throw switches

This panel mounting actuator is for operation by a straight line motion. An elastomer seal boot prevents entry of liquid splash or other foreign agents.

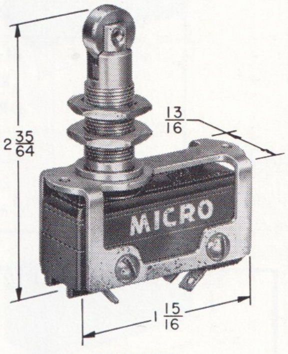
MCA2711H for type "A" switches

MCD2711H for double-pole double-throw switches



MC2711H

Auxiliary actuators for type "Z" switches, type "A" switches and double-pole double-throw switches have the same outside dimensions. However the actuating mechanisms vary with respect to the plunger locations of the switches on which they are used. Actuators shown here are for use with type "Z" switches. Catalog listings for type "A" switches and double-pole double-throw switches are also included. Except for the JR, all actuators shown here are for use with pin plunger type switches.



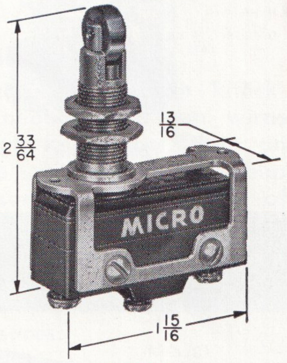
MD3211Q

Designed for panel mounting, this actuator is for operation by cams or slides whose approach is parallel to the longitudinal axis of the switch. For use with both type "Z" and double-pole double-throw switches.

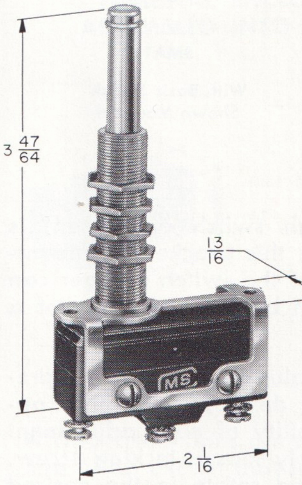
MDA3711Q for type "A" switches

Designed for panel mounting, this actuator is for operation by cams or slides whose approach is perpendicular to the longitudinal axis of the switch. For use with both type "Z" and double-pole double-throw switches.

MDA3711Q1 for type "A" switches



MD3211Q1



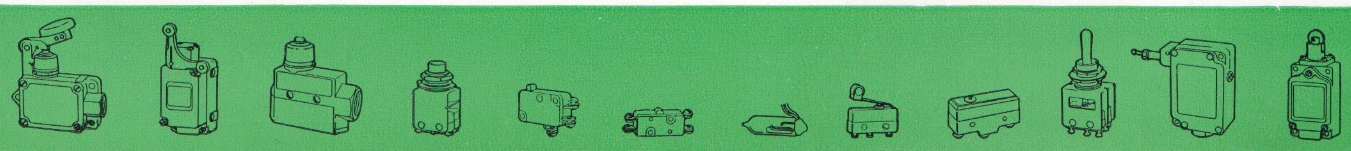
MC7711

Designed for panel mounting, the long threaded bushing permits considerable adjustment of the operating point. This actuator supplies the switch with a minimum overtravel of 13/16 inch.

MCA7711 for type "A" switches

MCD7711 for double-pole double-throw switches

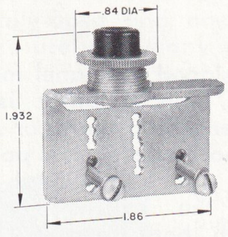
ACTUATORS AND SWITCHES ARE SOLD AS SEPARATE ITEMS, UNASSEMBLED AND MUST BE ORDERED SEPARATELY.



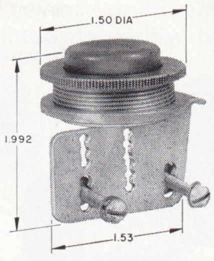
Pushbutton Actuators

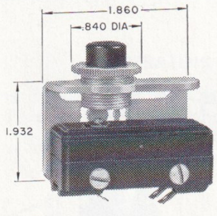
Versatile "12MA" actuators fit all pin-plunger basic switches in this catalog and "TB" switches in Catalog 63. When combined with basic switches, these actuators provide "custom-made" assemblies for almost any pushbutton switch requirements.

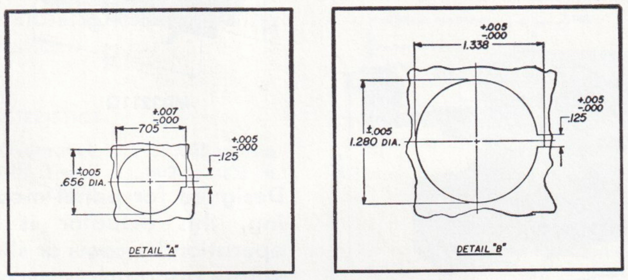
Three button colors are available in both ½-inch and 1-inch sizes. Smooth plastic buttons and clear anodized aluminum bushings present a neat, attractive panel-front appearance. Switch mounting holes and actuator mounting bushings are adjustable for panel thicknesses of .060" to .312". The adjustable switch mounting holes also allow the switch to be positioned for best button travel. Two sets of switch mounting screws and lockwashers are supplied with each actuator. Actuators and switches must be ordered as separate items.

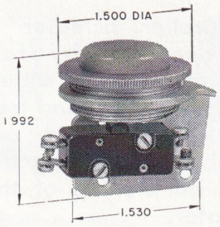

.84 DIA
1.932
1.86
Actuator with ½" Button

BUTTON DIAMETER	BUTTON COLOR	CATALOG LISTING
½ in.	BLACK RED GREEN	12MA1 12MA2 12MA3
1 in.	BLACK RED GREEN	12MA5 12MA6 12MA7

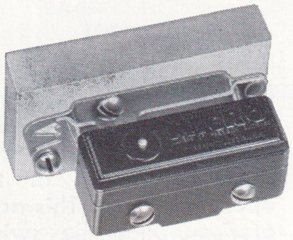

1.50 DIA
1.992
1.53
Actuator with 1" button


1.860
.840 DIA
1.932
12MA1 with Basic Switch

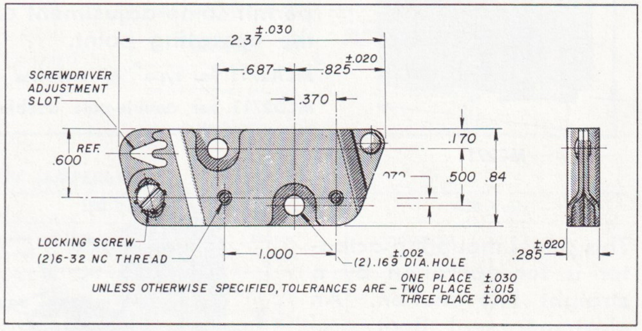

+.007 -.000
.705
+.005 -.000
.125
±.005
.656 DIA.
DETAIL "A"
+.005 -.000
1.338
+.005 -.000
.125
±.005
1.280 DIA.
DETAIL "B"
Diagrams of ½" and 1" Button Panel Mountings


1.500 DIA
1.992
1.530
12MA7 with Basic Switch

Time-Saving Adjustable Mounting Bracket


8MA1

With Basic Switch Shown Mounted


2.37 ±.030
.687
.825 ±.020
.370
SCREWDRIVER ADJUSTMENT SLOT
REF.
.600
.170
.070
.500
.84
LOCKING SCREW
(2)6-32 NC THREAD
1.000
(2).169 ±.002 DIA. HOLE
.285 ±.020
UNLESS OTHERWISE SPECIFIED, TOLERANCES ARE – ONE PLACE ±.030 TWO PLACE ±.015 THREE PLACE ±.005

Time previously lost through switch adjustment is virtually eliminated by using this bracket for mounting. The operating position of the switch plunger can be regulated up to .080 inch by a simple twist of a screwdriver.

This bracket is especially valuable for use on precision machine tools, timing devices, and other applications where the availability of easy adjustment is important. To adjust, simply loosen locking screw, insert screwdriver in slot, and rotate in the desired direction (see dimension drawing).

Made of sturdy cadmium-plated steel, the 8MA1 can be used with all MICRO SWITCH basic switches having #6 mounting holes on one-inch centers. The 8MA1 (pictured) has the adjustment slot positioned to the left. The 8MA2 has the slot to the right (mirror view of 8MA1).

NOTE: Dimensions shown in this catalog are subject to change. Current Drawings will be supplied by your nearest MICRO SWITCH branch office.

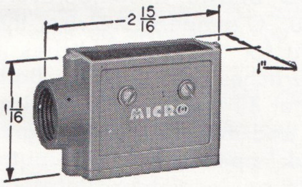
Terminal Enclosures

Terminal enclosures provide electrical insulation for terminals and wire connections of basic switches, and also protect the terminals themselves against shorting and grounds. In addition these switch insulators prevent personnel from coming in contact with exposed switch terminals.

The "3PA" series of terminal enclosures are of die cast aluminum which offers some physical protection to the switch and a means of mounting them in a fixed position.

The wiring outlet hub, integral with the housing, has ½ - 14 NPSM internally tapped threads for connection to conduit.

FOR SIDE MOUNTING

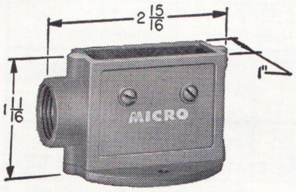


3PA1

Catalog Listing 3PA1 may be mounted from either side through two .140 inch diameter holes located on one inch centers.

Both the 3PA1 and 3PA2 will accommodate any basic switch covered in this catalog.

FOR BOTTOM MOUNTING



3PA2

Catalog Listing 3PA2 has a flanged bottom plate with two 11/64 inch diameter holes which will accept number 8 machine screws for mounting.

MOUNTING INSTRUCTIONS

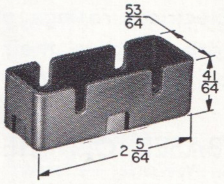
3PA2 with Roller-Leaf Switch Assembled

Lead wires are fed through conduit opening and attached to the basic switch terminals. The basic switch is then secured in the housing by the two screws, nuts and lockwashers provided. (Note: The assembly screws furnished with the 3PA1 are 1/4 inch longer than those furnished with the 3PA2, because they also serve as mounting screws for the enclosure.)

TERMINAL ENCLOSURES ARE SOLD AS SEPARATE ITEMS AND MUST BE ORDERED SEPARATELY.

MICRO SWITCH "5PA" series includes plastic terminal enclosures for basic switches with both screw type and solder type terminals as well as switches which have been assembled into auxiliary actuators.

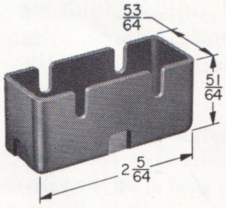
FOR SOLDER TYPE TERMINALS



5PA1

Catalog Listing 5PA1 is for use with any MICRO SWITCH basic switch which has solder type terminals.

FOR SCREW TERMINALS



5PA2

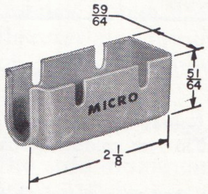
Catalog Listing 5PA2 is for use with any MICRO SWITCH basic switch which has screw terminals.

MOUNTING INSTRUCTIONS

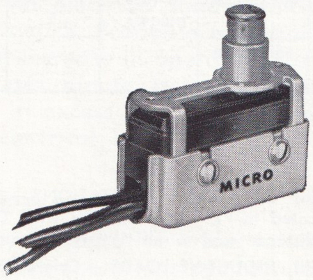
5PA2 with Switch Assembled

To mount, open the knock-outs needed and run wires through knock-outs, then on to the switch terminals. Slip enclosures over bottom of switch and mount switch into position. (Use flat washers under heads of mounting screws to prevent cracking terminal enclosures.)

TERMINAL ENCLOSURES FOR SWITCHES ASSEMBLED INTO AUXILIARY ACTUATORS

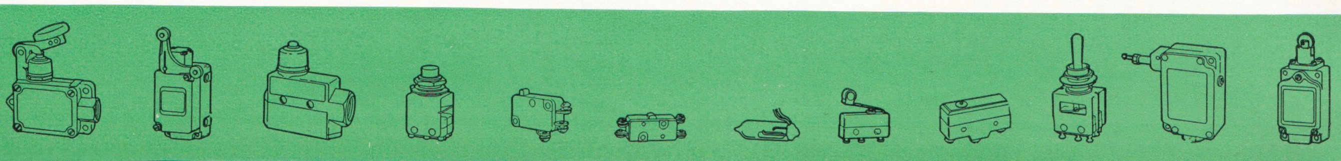


5PA3

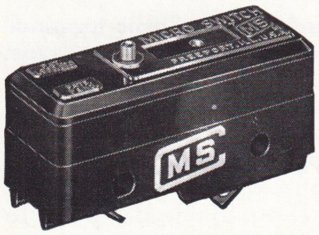


5PA3 with Switch and Actuator Assembled

Wiring instructions are the same as those for the 5PA1 and 5PA2 except that lead wires are fed through the "U" shaped opening.



Electrical Characteristics



Current and Contact Life Ratings for Type 'A' and 'Z' Switches

Electrical ratings of other switch types are listed in their respective sections.

RATINGS BASED ON THE FOLLOWING CONDITIONS:

A. Rating tests were conducted at 125, 250 and 480 volts a-c, 60 cycles, and 208 volts a-c, 400 cycles.

B. Tests were conducted under atmospheric pressure conditions approximating sea level and 80,000 feet elevation. It will be noted that altitude has no effect on current ratings of switches used in alternating current service.

C. Ratings are based on allowable temperature rise in current carrying parts.

The temperature rise allowed by the A. F. for aircraft service is 65° C. The maximum continuous current for aircraft service on either 400 or 60 cycles, based on a 65° C temperature rise is 25 amperes for "A" or "Z" type switches.

Underwriters' Laboratories allows a temperature rise of 30° C. Based on a 30° C temperature rise, the maximum continuous current for "Z" type switches is 15 amperes, for "A" type switches, 20 amperes. Both of these ratings apply to either 60 or 400 cycle service.

D. Tests were conducted and ratings based on a cycle of 60 "make and break" operations per minute.

1 Alternating Current Voltage	2 Type of Basic Switch	INDUCTIVE LOADS—See (b) 50% POWER FACTOR				NON-INDUCTIVE LOADS					
		3 Continuous Current Rating See (e)	4 Probable Contact Life See (f)	Restrict Starting Inrush Currents to Values below: See (b)		HEATERS See (c)		INCANDESCENT FILAMENTS See (d)			
								Heated Filament Load, Normally Closed Contacts		Heated Filament Load, Normally Open Contacts	
				5 Normally Closed Contacts	6 Normally Open Contacts	7 Rated Load	8 Probable Contact Life	9 Load	10 Prob.Cont.Life	11 Load	12 Prob.Cont.Life
		Amperes	Operations	Amperes	Amperes	Amperes	Operations	Amperes	Operations	Amperes	Operations
125 to 250 Volts, 60 to 400 Cycles	A	20	100,000	75	75	20	100,000	10	20,000	10	20,000
	A and Z (Except as noted in (a), below)	15	500,000	30	15	15	500,000	3	1,500,000	1.5	1,500,000
		10	1,500,000	30	15	10	1,500,000	3	1,500,000	1.5	1,500,000
		5	6,000,000	30	15	5	6,000,000	3	1,500,000	1.5	1,500,000
460 Volts 60 Cycles		3	1,500,000	15	7.5	3	1,500,000	3	1,500,000	1.5	1,500,000

NOTES ON CHART

(a) SWITCH LIFE LIMITATIONS — Contact life figures apply as indicated to "Z" type switches with .020 inch or .036 inch contact break distance and to all "A" type switches.

(b) INDUCTIVE LOADS — Column 3 contains the maximum permissible continuous loads for inductive applications. Maximum permissible starting current ratings are shown in columns 5 and 6. Do not attempt to control motors or solenoids whose starting or pull-in current demands exceed the values given in columns 5 and 6.

(c) HEATER LOADS — Nickel-chrome type heaters and other heater or rheostat loads fall into this group. These loads have a substantially constant resistance both at no-load and when fully loaded. Current demands are regarded as constant for most purposes.

(b) INCANDESCENT FILAMENTS — Tungsten filament type incandescent lamps and heaters of electronic tubes are characterized by a heavy inrush of current when voltage is applied to the cold filament. Because of the effects of this heavy inrush, the current ratings must be reduced when compared to other non-inductive loads.

(e) CONTINUOUS LOAD RATINGS—INDUCTIVE. Column 3 contains the ratings for sustained or continuous loading of switches on inductive circuits.

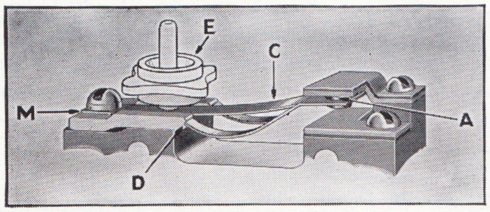
(f) PROBABLE CONTACT LIFE — Application of the ratings of this chart to large numbers of switches under test for contact life, will result in variations in contact life which can best be explained by statistical methods.

NOTE: Dimensions shown in this catalog are subject to change. Current Drawings will be supplied by your nearest MICRO SWITCH branch office.

Technical Information

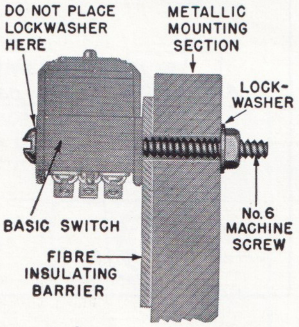
MICRO SWITCH PRINCIPLE OF SNAP-ACTION

The rapid snap-action motion of MICRO SWITCH basic switches is in the same direction as that of the operating plunger, as shown in the cut-away view below. This feature insures accurate repeatability, low operating force and motion, and long contact life.



The long member of the one-piece beryllium copper spring (C) is supported as a cantilever at (M). In the unoperated position the silver contact (A) is held against the upper stationary contact by the vertical upward component of force exerted by the side members of the spring. The two side blades (compression members) are supported in grooves in the anchor (D). Depression of the plunger (E) snaps the moveable contact from the upper stationary contact to the lower one.

INSTALLATION OF BASIC SWITCHES

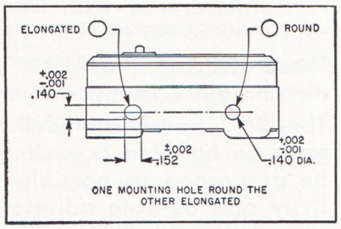


Proper installation is all-important to accuracy of operation and long life of a basic switch. Maximum efficiency and performance is assured if a few simple rules are followed.

1. Use only No. 6 screws.
2. Place lock washers so that they do not bear directly against the plastic case of the switch.
3. Mount switches against flat surfaces only.
4. If mounting surface is metal, place fibre or glass insulation between the metal and switch case.
5. Do not tighten screws to the point of cracking the phenolic switch case.

When mounting a panel mounting switch (ie., BZ-2RQ1) or auxiliary actuator (ie., MC7711) the thin hexagonal nuts are used against the panel, while the locknuts secure these mounting nuts.

MOUNTING



MICRO SWITCH basic switches may be mounted from either side through two .140 in. diameter mounting holes, which are located on one inch centers. One of the holes is elongated to .152 inch, providing greater ease in mounting the switch and locating it with respect to its actuating means.

DETERMINING FACTORS IN PROPER SELECTION OF SWITCHES

Atmosphere

In atmospheres containing dust, moisture, liquid splash or abrasives only sealed switches should be used, and then only when the terminals are protected from these harmful agents. MICRO SWITCH enclosed switches (covered in Catalog 101) are recommended for use in such adverse locations.

Temperature

Switches shown in this catalog are satisfactory for use in temperatures up to 180°F. For recommendation of switches which will operate at higher temperatures the nearest MICRO SWITCH branch office should be consulted. MICRO SWITCH manufactures special switches which will operate satisfactorily in a temperature range of minus 100°F. to plus 1000°F.

Physical Abuse

Switches shown in this catalog will not stand the abuse given by excessive impact, side thrust or vibration. Enclosed switches are usually recommended for applications where switches are subjected to physical abuse.

Lubrication

Switches need no lubrication. All switch parts, both internal and external, are lubricated at the factory for the life of the switch.

OVERLOADING OF SWITCHES

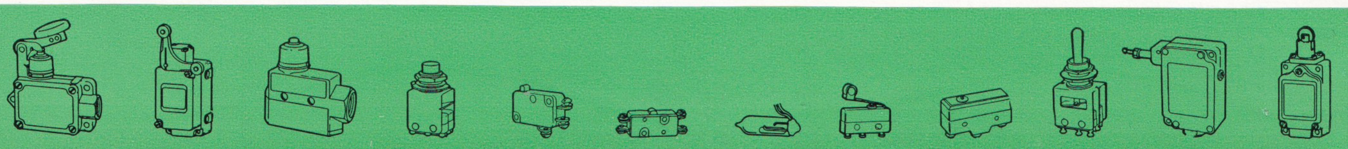
Overloading on a-c circuits will accelerate contact roughening. Severe overloading may even permanently weld the contacts. To insure against damage to the switch, use only as specified.

PROBABLE MECHANICAL LIFE

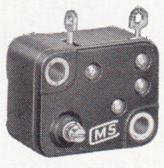
The flexure life of a switch is the probable number of mechanical operations (at no electrical load) which may be obtained from the switch. Probable mechanical life will diminish with an increase in operating frequency above 850 flexures per minute. However, 850 flexures per minute is well in excess of the safe rate of operation under rated electrical load.

RATE OF OPERATION

The safe maximum frequency of operation under rated load may be assumed to be 300 operations per minute for 60 cycle industrial applications. If the frequency of operation exceeds these limits, severe burning or welding of the contacts may result. If the frequency of operation is lower than the limits specified, a slightly increased rating may be assumed without risk. If the loading is not increased, some increase in contact life will result.

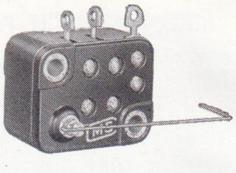


"V4" Low Force Rotary Switches



V4-12

Small "V4" switches are ideal for use in coin-operated devices, counting applications and other uses which require precise, sensitive snap-action operation. The switching element is the unique one-piece beryllium copper snap-action spring.



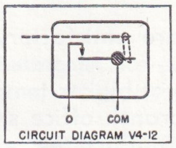
V4-14
(Actuator not furnished)

CHARACTERISTICS OF V4-12 and V4-14

Operating Torque	4 gram in., max.
Release Torque	.5 gram in., min.
Pretravel	20 degrees, max.
Overtravel	20 degrees, min.
Contact Separation	.008 in., min.
*Total Travel	38 degrees, min.

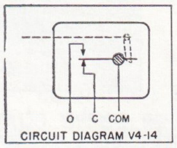
*Note—**Pretravel** will vary at values under 20 degrees, while **Overtravel** will vary at values over 20 degrees. The combined **Pretravel** and **Overtravel** constitute **Total Travel**. Quality Control measurements have shown the **Total Travel** to be consistently over 38 degrees.

Normally-Open Design



CIRCUIT DIAGRAM V4-12

Double-Throw Design

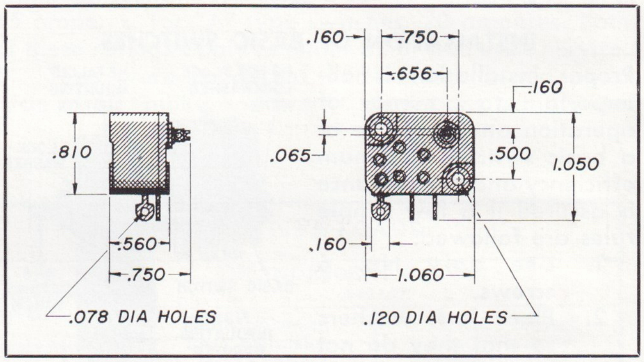


CIRCUIT DIAGRAM V4-14

Also May Be Used As Normally-Closed

ELECTRICAL RATING

The V4-12 and V4-14 are listed by Underwriters' Laboratories for 5 amperes, 125 or 250 volts a-c. Inrush current values should not exceed this rating. Refer to nearest branch office for advice on the use of these switches for direct current use.



MOUNTING

The "V4" switch should be mounted on a clean smooth surface so that the case will not be distorted when mounting screws are tightened. Use of lock washers under the heads of the mounting screws is recommended. Mounting screws should be tightened only enough to hold the switch snugly in place. Further tightening will result in a cracked or badly distorted switch case and changed operating characteristics.

Varnished fiberglass cloth or varnished cambric insulation should be used between the switch and the mounting surface if the latter is conductive. This prevents shorting of the leads to the machine frame and increases creepage distance from live parts to ground. Such insulation is absolutely necessary if the shaft side of the switch is mounted against a conductive surface, for small rivets are connected to current carrying internal parts.

TORQUE ADJUSTMENT

Torque produced by the weight of the actuator lever should be kept at the minimum required by the application and should never exceed the minimum specified release torque.

Side play possible at the end of the arm (end play of shaft and flexure of wire—especially longer lengths) must be considered when attempting to use actuating arms or formed shapes in narrow slots such as in coin mechanisms.

Any interference with free motion of the actuating arm may cause trouble.

These switches should be protected from water, oil, dirt, or other harmful agents.

The "V4" switch is a delicate, precision device, and must be handled accordingly. This switch is built to be as rugged as possible—consistent with the sensitivity and delicate adjustment required. In some respects this switch is similar to a watch or any other precision device in that it can be damaged by severe mechanical shocks caused by dropping, etc.

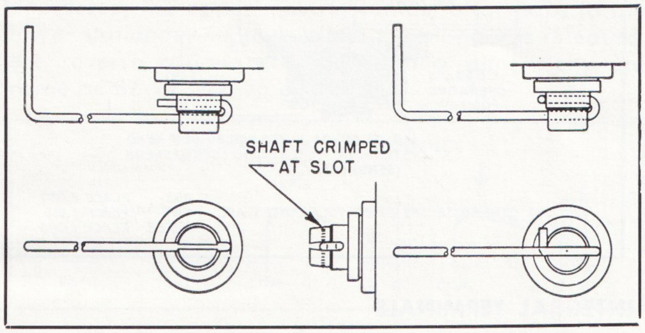
NOTE: Dimensions shown in this catalog are subject to change. Current Drawings will be supplied by your nearest MICRO SWITCH branch office.

"V4" Low Force Rotary Switches (cont.)

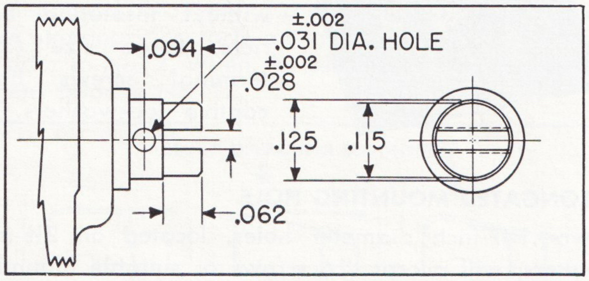
ACTUATOR LEVER

Actuator levers are not supplied with V4-12 and V4-14 switches because of the large variety of actuator designs which would be required to fit all possible applications. Equipment manufacturers can best design, test, and attach actuators.

The brass actuating shaft is drilled and slotted to accept the actuating wire. Stainless steel or music wire is recommended for use as the actuating wire. Under special conditions hard drawn aluminum wire may also be used.


SHAFT CRIMPED
AT SLOT

"V4" SHAFT DIMENSIONS


.094
±.002
.031 DIA. HOLE
±.002
.028
.125
.115
.062

The above dimensions are for use in designing the actuator lever. The application will determine the length, diameter, shape, and the material of this lever.

APPLICATION TESTING
INSURES CORRECT SWITCH OPERATION

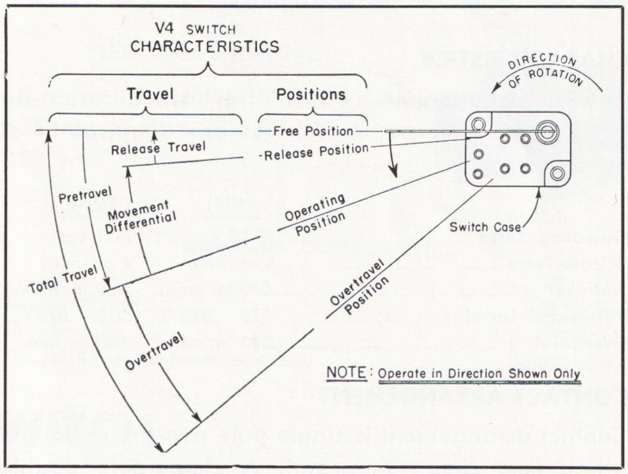
Because of the many variables involved in different actuators, electrical loads, frequency of operation, etc., it is often impossible to predict switch and equipment performance exactly. The need for careful and thorough testing by the equipment designer cannot be over-emphasized. Slight changes in a coin chute, actuator arm, or switch location may make the difference between satisfactory and unsatisfactory switch operation. Although switch characteristics are held to the closest possible production tolerances, there is inevitably some variation from switch to switch. The equipment designer should not make conclusions based upon the performance of a single switch.

The diameter of the wire should not exceed .026 inch. Actuator lever length, diameter, shape, and material require careful attention. Length and shape of the actuator lever must be chosen only after considering the torque characteristics of the application and the switch.

TRAVEL CHARACTERISTICS

Where falling coins operate the switch, full use of the Total Travel inherent in the switch will result in the most favorable contact closure time. Keeping the coin in contact with the actuator and slowing the coin as much as is practical will further increase duration of contact.

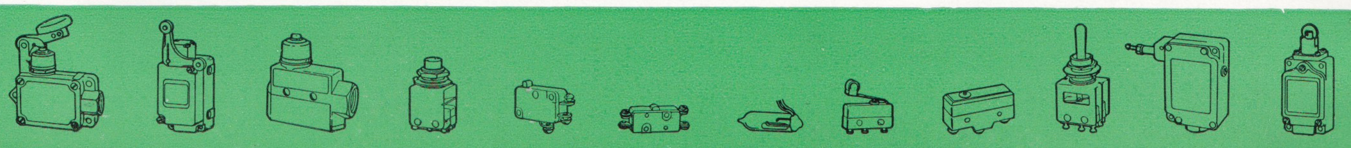
Type "V4" switches are designed for operation in one direction only.


V4 SWITCH
CHARACTERISTICS
Travel
Positions
DIRECTION OF ROTATION
Free Position
Release Travel
Release Position
Pretravel
Movement Differential
Operating Position
Switch Case
Total Travel
Overtravel Position
Overtravel
NOTE: Operate in Direction Shown Only

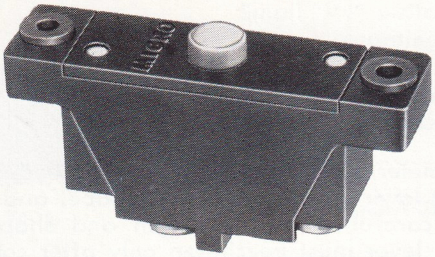
SOLDERING TO TERMINALS

Acid soldering flux should never be used to attach leads to these switches. Avoid using excessive amounts of flux which may flow into the switch enclosure causing failure by corrosion or dielectric breakdown. If flux reaches the contacts a "no circuit" condition may result.

The solder lug terminals on this switch have a narrow section intended to reduce the hazards of heat transfer to the switch interior. This narrow section also reduces possibility of twisting and shifting the alignment of carefully adjusted internal parts.



"3MN" Two-Circuit Double-Break Switches



Series "3MN" switches are for use with limit or control mechanisms on machine tools, presses and other industrial equipment. Three switches have a combined stacking width of only 2.03 inches (see photo at right). Gang-mounted units are individually replaceable.

STEP DESIGN CASE

Overtravel is .080-inch minimum. Median mechanical life exceeds 10,000,000 operations at full overtravel. The "3MN" step design case gives added space between terminals, reducing the possibility of shorting. The case is of arc-resistant plastic.

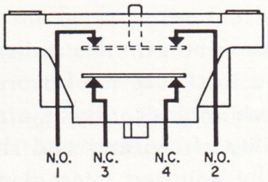
CHARACTERISTICS

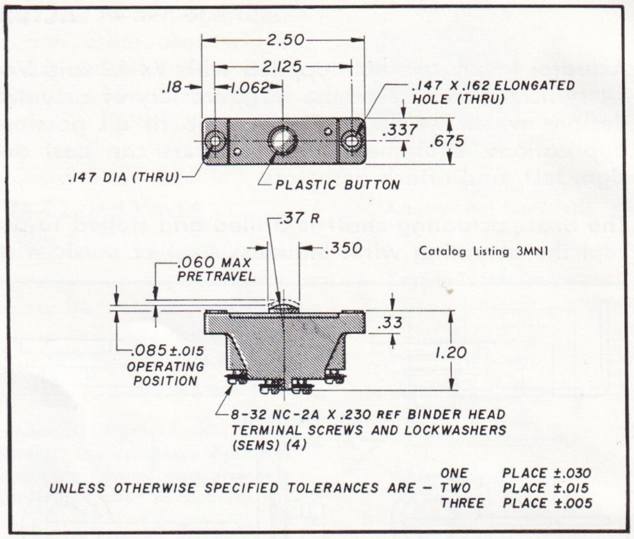
Catalog Listings 3MN1 and 3MN6 have different operating and release forces, but are identical in all other respects.

	3MN1	3MN6
Operating Force	12-20 oz.	7-11 oz.
Release Force	6 oz. min.	4 oz. min.
Pretravel	.060 in. max.	.060 in. max.
Differential Travel	.015 - .025 in.	.015 - .025 in.
Overtravel	.080 in. min.	.080 in. min.

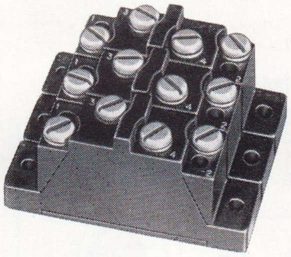
CONTACT ARRANGEMENT

Contact arrangement is single-pole two-circuit double-break (see circuit diagram). A single-pole double-throw contact arrangement may be obtained by tying together Nos. 1 and 3, or 2 and 4, and using this as the common terminal. Polarity designations are clearly marked on the bottom of the switch case. Two terminals of the same polarity must be connected to the line or to the load to prevent a possible short circuit through the arc.


N.O.
1
N.C.
3
N.C.
4
N.O.
2


2.50
2.125
.18
1.062
.147 X .162 ELONGATED HOLE (THRU)
.337
.675
.147 DIA (THRU)
PLASTIC BUTTON
.37 R
.350
Catalog Listing 3MN1
.060 MAX PRETRAVEL
.33
1.20
.085±.015 OPERATING POSITION
8-32 NC-2A X .230 REF BINDER HEAD TERMINAL SCREWS AND LOCKWASHERS (SEMS) (4)
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE – ONE PLACE ±.030 TWO PLACE ±.015 THREE PLACE ±.005

INTEGRAL TERMINALS



The unique arrangement of the integral terminals permits gang mounting without insulating barriers. Large size (#8) terminal screws have captive lockwashers.

ELONGATED MOUNTING HOLE

Two .147-inch diameter holes, located on 2⅛-inch centers, will accept #6 screws or suitable mounting pins. One of the holes is elongated to .162-inch to eliminate the need for close tolerance in the center-to-center distance between mounting holes on the equipment.

ELECTRICAL DATA

Catalog Listings 3MN1 and 3MN6 are Underwriters' Laboratories listed for the following ratings:
15 amps., 120, 240, 480, or 600 vac;
½ H. P., 120 vac; 1 H.P., 240 vac;
0.8 amp., 115 vdc; 0.4 amp., 230 vdc.

PILOT DUTY RATING

	Steady State Current	Inrush Current
125 vac	6.0 amps.	60 amps.
250 vac	3.0 amps.	30 amps.
480 vac	1.5 amps.	15 amps.
600 vac	1.2 amps.	12 amps.

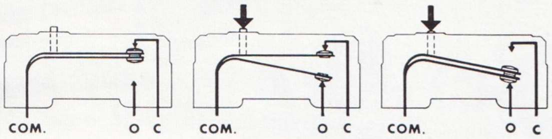
NOTE: Dimensions shown in this catalog are subject to change. Current Drawings will be supplied by your nearest MICRO SWITCH branch office.

Special Operating Sequences

MAKE-BEFORE-BREAK SWITCH

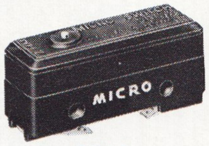
This single-pole double-throw switch has two moving contacts that provide a momentary overlap of circuits when switching from one position to the other. It finds use where circuits must be switched with no interruption while switching. As the plunger is depressed the lower moving contact snaps to the lower stationary contact and both normally-closed and normally-open circuits are made. As the plunger is further depressed, the upper moving contact also snaps to the lower stationary contact. When the plunger is released, the reverse action occurs. Mounting dimensions are same as BZ-2R, shown on Page 4.

BZ-2G OPERATING SEQUENCE



ELECTRICAL RATING

10 amps. 125, 250 or 480 vac; resistive load ½ amp. 125 vdc; resistive load, ¼ amp. 250 vdc.



BZ-2G

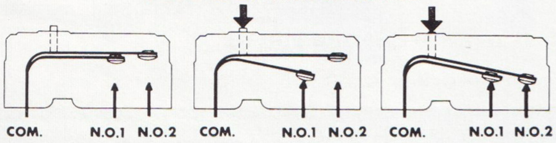
OPERATING CHARACTERISTICS

Operating Force (to break N.C. circuit)	20 oz. max.
Release Force (to break N.O. circuit)	8 oz. min.
Operating Point (to break N.C. circuit)	.625 ± .015 in.
Differential Travel (between breaking of N.C. and breaking of N.O. circuits)	.015 in. max.
Overtravel (beyond N.C. breaking point)	.005 in. min.
Plunger Travel between Operating points and between Release Points of Movable Contacts	.005 to .010 in.

MAKE-BEFORE-MAKE SWITCH

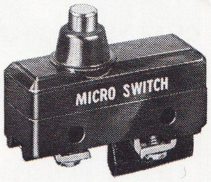
As the plunger of this single-pole double-throw switch is depressed, two moving contacts snap to their respective stationary contacts an interval apart, closing No. 1 prior to No. 2. When the plunger is released, No. 2 opens prior to No. 1.

6BS1-B OPERATING SEQUENCE



ELECTRICAL RATING

10 amps. 125 or 250 vac; ⅓ H.P. 125 vac; ½ amp. 125 vdc; ¼ amp. 250 vdc.



6BS1-B

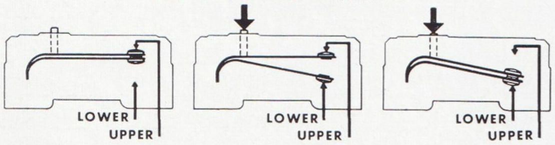
OPERATING CHARACTERISTICS

Operating Force	35 oz. max.
Release Travel	.005 in. min.
Release Force	10 oz. min.
Plunger Travel (between positions)	.020 in. min.

PULSE SWITCH

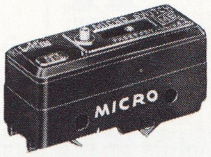
This single-pole single-throw (momentary contact) switch provides a pulse each time the plunger is depressed, but not when it is released. As the plunger is depressed, a circuit is made between the upper and lower stationary contacts. Further plunger travel breaks the circuit. Release of the plunger causes the movable contacts to return directly to the un-operated position **without** causing a pulse. Mounting dimensions are same as the BA-2R, shown on Page 14.

9BS1 OPERATING SEQUENCE



ELECTRICAL RATING

10 amps. 125 or 250 vac. For applications not within these limits, please consult MICRO SWITCH branch office.

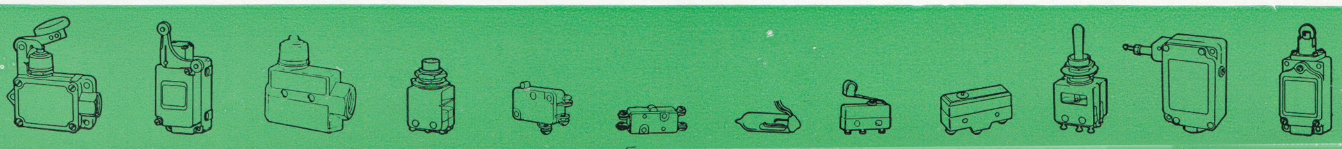


9BS1

OPERATING CHARACTERISTICS

Operating Force	15-35 ozs.
Release Force	5 ozs. min.
Free Position	.725 in. max.
1st. Operating Position	.65 in.
2nd. Operating Position	0.009-0.016 in. below 1st operating point
Release Position	0.030 in. max. above 1st operating point
Overtravel	0.005 in. min.

For further information on switches with special operating sequences, consult your nearest MICRO SWITCH Branch Office.



MICRO
MICRO SWITCH
EXPLOSION PROOF SWITCH
Underwriters Laboratories Inc.
INSPECTED

H
HONEYWELL

MICRO SWITCH

FREEPORT, ILLINOIS
A DIVISION OF HONEYWELL
IN CANADA: HONEYWELL CONTROLS LIMITED, TORONTO 17, ONTARIO

BRANCH OFFICES AND AUTHORIZED DISTRIBUTORS THROUGHOUT THE UNITED STATES
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Form No. 84-150N W-10-3 Printed in U.S.A.

MICRO SWITCH LIST PRICE and DISCOUNT SCHEDULE D-62N

Covering MICRO SWITCH Products in Catalog 62f

Prices effective April 20, 1962. This issue supersedes D-62M

TERMS AND CONDITIONS OF SALE

(a) **DATA** — All the data published in this schedule is effective as of the above date and is subject to change without notice.

(b) **ERRORS** — All stenographic and clerical errors are subject to correction.

(c) **DISCOUNTS AND PRODUCT CLASSES** — Discounts are based on quantity ordered and shipped against one purchase order. All MICRO SWITCH products of the same product class and on one purchase order may be combined for quantity discount. Switches of different product classes may not be combined for quantity discount. Unclassified products may not be combined for quantity discount.

(d) **SHIPMENTS** — All prices are F.O.B. Freeport, Illinois.

(e) **TAXES** — The amount of any and all taxes shall be added to the price and be paid by the purchaser because of transaction under effective statute, or in lieu thereof, the purchaser shall furnish the seller with tax exempt certificates acceptable to the taxing authorities.

(f) **TERMS OF PAYMENT** — Net thirty (30) days.

(g) **WARRANTY** — Seller warrants its products to be free from defects in material and workmanship under normal use and service and seller will repair or replace without charge any such product it finds to be so defective on its return to seller within one year of date of shipment to the original purchaser. The foregoing is in lieu of all other expressed or implied warranties (except of title), guarantees, obligations, or liabilities on seller's part.

All Listings on this page subject to Discount "H", Product Class 3

CATALOG LISTING	PRICE	PAGE
BZ-2R	$ 1.57	4
BZ-2R-A2	1.71	4
BZ-2R-P4	1.87	4
BZ-2RT	1.71	4
BZ-2RS	1.95	4
BZ-2RS-A2	2.03	4
BZ-2RS-P4	2.14	4
BZ-2RST	2.03	4
BZ-2RD	1.95	4
BZ-2RD-A2	2.03	4
BZ-2RD-P4	2.14	4
BZ-2RDT	2.03	4
BZ-2RW80	2.00	5
BZ-2RW80-A2	2.09	5
BZ-2RW80-P4	2.25	5
BZ-2RWT80	2.09	5
BZ-2RW84	2.00	5
BZ-2RW84-A2	2.09	5
BZ-2RW84-P4	2.25	5
BZ-2RW84T	2.09	5
BZ-2RW863	2.11	5
BZ-2RW863-A2	2.25	5
BZ-2RW863-P4	2.41	5
BZ-2RW863T	2.25	5
BZ-2RL	1.73	5
BZ-2RL-A2	1.87	5
BZ-2RL-P4	1.98	5
BZ-2RLT	1.87	5
BZ-2RW82	2.54	6
BZ-2RW82-A2	2.62	6
BZ-2RW82-P4	2.78	6
BZ-2RW82T	2.62	6
BZ-2RW822	2.54	6
BZ-2RW822-A2	2.62	6
BZ-2RW822-P4	2.78	6
BZ-2RW822T	2.62	6
BZ-2RW825	$ 3.03	6
BZ-2RW825-A2	3.16	6
BZ-2RW825-P4	3.32	6
BZ-2RW825T	3.16	6
BZ-2RW826	3.03	6
BZ-2RW826-A2	3.16	6
BZ-2RW826-P4	3.32	6
BZ-2RW826T	3.16	6
BZ-2RL2	2.22	7
BZ-2RL2-A2	2.35	7
BZ-2RL2-P4	2.51	7
BZ-2RL2T	2.35	7
BZ-2RQ1	3.55	7
BZ-2RQ1-A2	3.64	7
BZ-2RQ1-P4	3.80	7
BZ-2RQ1T	3.64	7
BZ-2RQ18	6.25	7
BZ-2RQ18-A2	6.34	7
BZ-2RQ18-P4	6.45	7
BZ-2RQ18T	6.34	7
BZ-2RQ181	6.25	7
BZ-2RQ181-A2	6.34	7
BZ-2RQ181-P4	6.45	7
BZ-2RQ181T	6.34	7
BZ-2RW899	2.50	8
BZ-2RW899-A2	2.59	8
BZ-2RW899-P4	2.70	8
BZ-2RW899T	2.59	8
BZ-RW922	8.96	8
BZ-RW922-A2	9.05	8
BZ-RW922-P4	9.16	8
BZ-RW922T	9.05	8
BZ-2R55	2.54	9
BZ-2R55-A2	2.62	9
BZ-2R55-P4	2.78	9
BZ-2R55T	2.62	9
BZ-2RS55	$ 2.86	9
BZ-2RS55-A2	2.95	9
BZ-2RS55-P4	3.11	9
BZ-2RS55T	2.95	9
BZ-2RDS	4.07	9
BZ-2RDS-A2	4.16	9
BZ-2RDS-P4	4.27	9
BZ-2RDST	4.16	9
BZ-2RL55	2.65	10
BZ-2RL55-A2	2.78	10
BZ-2RL55-P4	2.89	10
BZ-2RL55T	2.78	10
BZ-2RW855	2.92	10
BZ-2RW855-A2	3.00	10
BZ-2RW855-P4	3.16	10
BZ-2RW855T	3.00	10
BZ-2RW8255	3.40	10
BZ-2RW8255-A2	3.54	10
BZ-2RW8255-P4	3.65	10
BZ-2RW8255T	3.54	10
BZ-2RW82255	3.40	10
BZ-2RW82255-A2	3.54	10
BZ-2RW82255-P4	3.65	10
BZ-2RW82255T	3.54	10
BZ-R	1.93	11
BZ-R-A2	2.02	11
BZ-R19	5.35	11
BZ-R19-A2	5.44	11
BZ-RX	1.73	12
BZ-RSX	2.06	12
BZ-RW80X	2.11	12
6AS13	5.35	13
6AS18	5.85	13
BM-1R-A2	1.85	13

MICRO SWITCH LIST PRICE and DISCOUNT SCHEDULE D-62N

CATALOG LISTING	PRICE	PAGE
BA-2R	$ 1.89	14
BA-2R-A2	1.71	14
BA-2R-P4	1.87	14
BA-2RT	1.71	14
BA-2RB	2.22	14
BA-2RB-A2	2.03	14
BA-2RB-P4	2.14	14
BA-2RBT	2.03	14
BA-2RQ1	3.87	14
BA-2RQ1-A2	3.64	14
BA-2RQ1-P4	3.70	14
BA-2RQ1T	3.64	14
BA-2RL	2.00	15
BA-2RL-A2	1.87	15
BA-2RL-P4	1.98	15
BA-2RLT	1.87	15
BA-2RL2	2.54	15
BA-2RL2-A2	2.35	15
BA-2RL2-P4	2.51	15
BA-2RL2T	2.35	15

CATALOG LISTING	PRICE	PAGE
BA-2RV	$ 2.38	15
BA-2RV-A2	2.14	15
BA-2RV-P4	2.35	15
BA-2RVT	2.14	15
BA-2RV2	2.86	15
BA-2RV2-A2	2.68	15
BA-2RV2-P4	2.84	15
BA-2RV2T	2.68	15
BA-2RV22	2.86	16
BA-2RV22-A2	2.68	16
BA-2RV22-P4	2.84	16
BA-2RV22T	2.68	16
BE-2R-A4	1.94	16

All above listings are subject to Discount "H" and are in Product Class 3

The following listings vary in discounts and product classes as noted.

CATALOG LISTING	PRICE	DIS-COUNT	PRODUCT CLASS	PAGE
MT-4R	$ 4.30	H	37	17
MT-4R-A28	4.48	H	37	17
MT-4RL	4.65	H	37	17
MT-4RL-A28	4.73	H	37	17
MT-4RL2	5.05	H	37	18
MT-4RL2-A28	5.13	H	37	18
MT-4RV	4.90	H	37	18
MT-4RV-A28	5.03	H	37	18
MT-4RV2	5.30	H	37	18
MT-4RV2-A28	5.38	H	37	18
MT-4RV22	5.30	H	37	18
MT-4RV22-A28	5.38	H	37	18
DT-2R-A7	7.35	H	26	19
DT-2RV-A7	7.70	H	26	19
DT-2RV3-A7	7.70	H	26	19
DT-2RV2-A7	8.05	H	26	20
DT-2RV23-A7	8.05	H	26	20
DT-2RV22-A7	8.05	H	26	20
DT-2RV212-A7	8.05	H	26	20
BZ-3YT	4.48	H	3	21
BZ-3AT	3.50	H	3	22
BA-3ST	3.55	H	3	22

CATALOG LISTING	PRICE	DIS-COUNT	PRODUCT CLASS	PAGE
JR	$ 1.40	H	4	23
AD5721R	1.51	H	4	23
ADA3721R	1.49	H	4	23
ADD3721R	1.45	H	4	23
MC2711	1.76	H	4	23
MCA2711	1.85	H	4	23
MCD2711	1.83	H	4	23
MC2711H	2.79	H	4	23
MCA2711H	4.10	H	4	23
MCD2711H	2.87	H	4	23
MC7711	3.56	H	4	23
MCA7711	3.96	H	4	23
MCD7711	3.84	H	4	23
MD3211Q	4.96	H	4	23
MDA3711Q	5,06	H	4	23
MD3211Q1	4.88	H	4	23
MDA3711Q1	5.06	H	4	23
12MA1	3.25	H	4	24
12MA2	3.25	H	4	24
12MA3	3.25	H	4	24
12MA5	3.50	H	4	24
12MA6	3.50	H	4	24
12MA7	3.50	H	4	24
8MA1	1.35	H	4	24
8MA2	1.35	H	4	24
3PA1	1.75	H	Unclassified	25
3PA2	1.75	H	Unclassified	25
5PA1	.18*	H	103	25
5PA2	.21*	H	103	25
5PA3	.87	H	103	25
V4-12	1.85	G	14	28
V4-14	2.18	G	14	28
3MN1	3.30	K	25	30
3MN6	3.30	K	25	30
BZ-2G	3.35	H	3	31
9BS1	4.50	H	3	31
6BS1-B	6.05	H	3	31

* Minimum order 5 units.

Discount Schedule

"K" DISCOUNT

1 - 9	None
10 - 19	10%
20 - 49	20%
50 - 99	30%
100 - 199	35%
200 - 499	37%

"R" DISCOUNT

1 - 24	None
25 - 99	10%
100 - 499	18%
500 - 999	26%
1000 & over	28%

"G" DISCOUNT

1 - 99	None
100 - 499	45%
500 - 999	55%
1000 - 1000	61%
2000 - 9999	62.5%

"H" DISCOUNT

1 - 9	None
10 - 19	10%
20 - 49	20%
50 - 99	30%
100 - 199	35%
200 - 499	37%

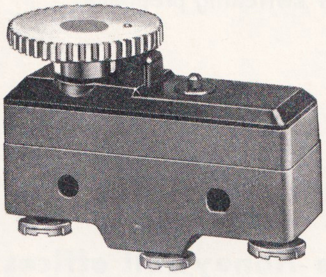
HONEYWELL
MICRO SWITCH
FREEPORT, ILLINOIS
A DIVISION OF HONEYWELL
IN CANADA: HONEYWELL CONTROLS LIMITED, TORONTO 17, ONTARIO

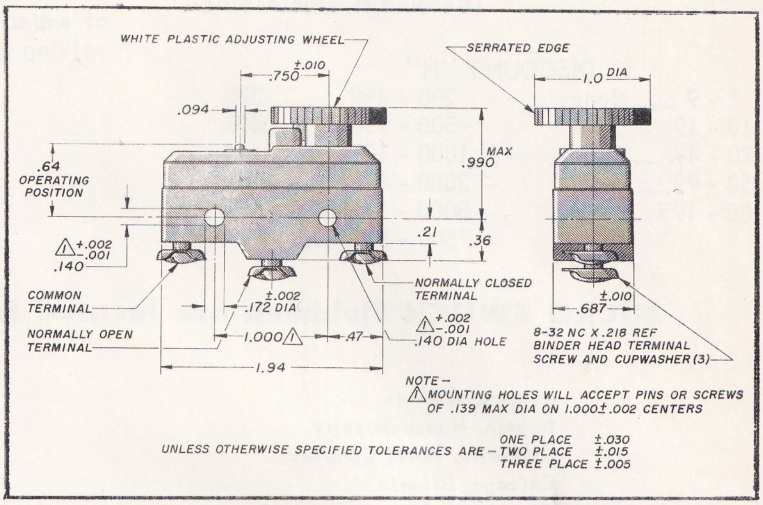
84- 156P MS-5-3 PRINTED IN U.S.A.

data sheet 179
Supplement to Catalog 62

MICRO SWITCH Precision Switches

ADJUSTABLE "DIFFERENTIAL TRAVEL" SWITCH




WHITE PLASTIC ADJUSTING WHEEL
±.010
.750
.094
.64
OPERATING POSITION
+.002
-.001
.140
COMMON TERMINAL
NORMALLY OPEN TERMINAL
±.002
.172 DIA
1.000
.47
1.94
MAX
.990
.21
.36
NORMALLY CLOSED TERMINAL
+.002
-.001
.140 DIA HOLE
SERRATED EDGE
1.0 DIA
±.010
.687
8-32 NC X .218 REF
BINDER HEAD TERMINAL
SCREW AND CUPWASHER (3)
NOTE –
MOUNTING HOLES WILL ACCEPT PINS OR SCREWS OF .139 MAX DIA ON 1.000±.002 CENTERS
UNLESS OTHERWISE SPECIFIED TOLERANCES ARE – ONE PLACE ±.030
TWO PLACE ±.015
THREE PLACE ±.005

Catalog Listing 10BS210 features adjustable differential travel. Incorporated as the switching element of such precision devices as pressure controls and blower fan controls, this switch permits fine adjustment of on-off cycling characteristics.

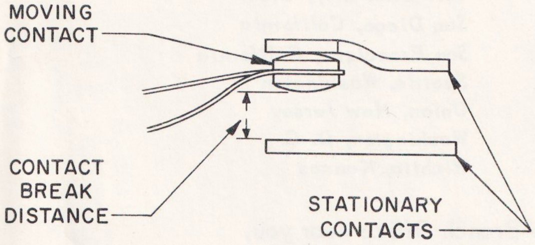

MOVING CONTACT
CONTACT BREAK DISTANCE
STATIONARY CONTACTS

Figure 1.

ADJUSTABILITY

A turn of the dial wheel on top of the switch varies the contact break distance (see Figure 1), which in turn changes the differential travel and other characteristics shown in Figure 2. The differential travel is adjustable from .0025 to .007 inch through a dial rotation of 300°. As differential travel is increased the pretravel, operating force and differential force increase (see Operating Characteristics).

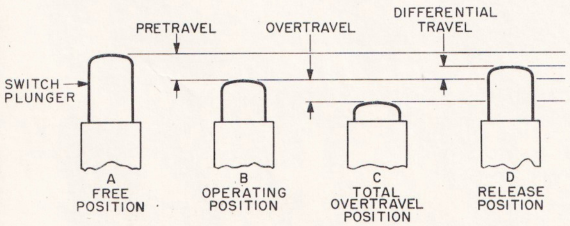

PRETRAVEL
OVERTRAVEL
DIFFERENTIAL TRAVEL
SWITCH PLUNGER
A
FREE POSITION
B
OPERATING POSITION
C
TOTAL OVERTRAVEL POSITION
D
RELEASE POSITION

Figure 2.

CONSTRUCTION

The 10BS210 utilizes the same unique, one piece spring and long life, butting type contacts of fine silver as other standard MICRO SWITCH precision switches. Plastic parts are molded of asbestos and mineral filled phenolic to insure utmost stability and precise operating characteristics.

Contact arrangement is single-pole double-throw.

No. 8-32 by .219-inch long terminal screws and cup washers provide for fast, strong wiring connections.

MECHANICAL LIFE

Mechanical operating life with no electrical load is determined by the degree of spring flexure. At the minimum differential travel setting, life is 5,000,000 (min.) operations. The maximum setting reduces life to 50,000 (min.). For life figures under various electrical loads contact a MICRO SWITCH branch office.

ELECTRICAL RATING

The 10BS210 is rated for 20 amps., 125, 250, or 460 vac; ¾ hp, 115 vac; 1½ hp, 230 vac.

OPERATING CHARACTERISTICS

Differential Travel	.0025 to .007 in. (adjustable)
Operating Force	12 to 32 oz. *
Differential Force	2 to 15 oz. *
Release Force	10 oz. min. (unaffected by Differential Travel setting.)

* Will vary with Differential Travel setting.

More information on other side.

MICRO SWITCH

data sheet 179
Supplement to Catalog 62

PRICING INFORMATION

Catalog Listing 10BS210 ____ $3.50 list, subject to Discount H, Unclassified.

DISCOUNT "H"

1 - 9	None	200 - 499	37%
10 - 19	10%	500 - 999	40%
20 - 49	20%	1000 - 1999	44%
50 - 99	30%	2000 - 4999	48%
100 - 199	35%	5000 - 7499	51%
		7500 - 9999	54%

NOTE: If your application requires a variation of the switch covered in this data sheet, contact a MICRO SWITCH Branch Office . Each has a competent staff of experienced engineers to offer you assistance in solving any of your switching problems.

MICRO SWITCH Fieldmen are located in these Honeywell offices

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For address and telephone number of the Branch Office near you, see the Yellow Pages of your telephone directory.

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